User's Guide

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Important Safety Instructions

Read all of these instructions and save them for later reference. Follow all warnings and instructions marked on the computer.

- Unplug the computer before cleaning. Clean with a damp cloth only. Do not spill liquid on the computer.
- Do not place the computer on an unstable surface or near a radiator or heat register.
- Do not block or cover the openings in the computer's cabinet. Do not insert objects through the slots.
- Use only the type of power source indicated on the computer's label.
- Connect all equipment to properly grounded power outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.
- Do not let the computer's power cord become damaged or frayed.
- If you use an extension cord with the computer, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total of all devices plugged into the wall outlet does not exceed 15 amperes.
- Except as specifically explained in this Users *Guide*, do not attempt to service the computer yourself.
- Unplug the computer and refer servicing to qualified service personnel under the following conditions: If the power cord or plug is damaged; if liquid has entered the computer; if the computer has been dropped or the cabinet damaged; if the computer does not operate normally or exhibits a distinct change in performance. Adjust only those controls that are covered by the operating instructions.
- If you plan to use the computer in Germany, observe the following:

  To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

  Beim Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Uberstromschutzschalter abgesichert ist.

Importantes instructions de sécurité

Lire attentivement les instructions suivantes et les conserver pour les consulter en cas de besoin. Observer soigneusement tous les avertissements et directives marqués sur l'ordinateur.

- Débrancher l'ordinateur avant de le nettoyer. N'utiliser qu'un chiffon humide. Veiller à ne pas renverser de liquides sur l'appareil.
- Ne pas placer l'ordinateur sur une surface instable ni près d'une source de chaleur.
- Ne pas bloquer ni couvrir les orifices d'aération de l'appareil. Ne pas introduire d'objets dans les ouvertures.
- Utiliser seulement le type de source d'alimentation électrique indiqué sur l'étiquette.
- Tout l'équipement doit être branché sur des prises de courant avec contact de terre. Ne jamais utiliser une prise sur le même circuit qu'un appareil à photocopies ou un système de contrôle de ventilation avec commutation marche-arrêt automatique.
- S'assurer que le cordon d'alimentation de l'ordinateur n'est pas abîmé effiloché.
- Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, s'assurer que l'intensité en ampères requise pour tous les appareils branchés sur ce cordon ne soit pas supérieure à la capacité du cordon. S'assurer aussi que cette intensté ne dépasse jamais la somme de 15 ampères pour l'ensemble des appareils.
- Sauf dans les cas spécifiques expliqués dans ce manuel de l'usager, ne pas essayer d'entretenir ou de réparer l'ordinateur soi-même.
- Débrancher l'ordinateur et contacter un technicien qualifié dans les circonstances suivantes:

  Si le cordon ou la prise sont abîmés; si un liquide a pénétré a l'intérieur de l'appareil; si on a laissé tomber l'appareil ou si le bonîtier est end ommagé; si l'ordinateur ne fonctionne pas normalement ou fonctionne d'une manière très différente de l'ordinaire. N'ajuster que les commandes décrites dans les directives.
- Pour utiliser l'ordinateur en Allemagne, il est nécessaire que le bâtiment soit muni d'un disjoncteur de 16 ampères pour protéger l'ordinateur contre les courts-circuits et le survoltage.

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Introduction

Your new EPSON® Endeavor™VL computer is a fast, high-performance system designed for flexibility and future expandability. Two VESA local bus (VL-Bus) option slots are standard, in addition to the following features:

- 486SX, DX, or DX2 processor upgradable to faster, more powerful powerful processors, including SX2, DX4, and Pentium™ OverDrive processors
- 4MB of internal memory, expandable to 40MB
- System and video BIOS shadow RAM
- 8KB of internal processor cache, with support for 64KB, 128KB, or 256KB external cache
- Math coprocessor built into the microprocessor for the DX and DX2 systems
- High-speed, 32-bit, local bus IDE hard disk drive interface
- Two built-in serial ports and one built-in parallel port
- Built-in PS/2™ compatible keyboard and mouse ports
- Two 16-bit (or 8-bit) ISA option slots and two 32-bit VL-Bus slots (VL-Bus slots can also be used for ISA cards)
- Support for up to three internal mass storage devices
- Password security
- VL-bus video card (if you purchased your computer in the United States).

The VL-Bus specification means that your system supports 32-bit data transfer at speeds of up to 33 MHz, and uses the full address range of the 486 processor chip. Bus mastering and burst-mode transfers are additional features that increase the power and performance of your computer. In fact, the VL-Bus standard can process 20 times more data per second than an ISA bus.

The VESA option slots allow you to install high-performance, VESA-compliant devices such as a graphics accelerator card, SCSI adapter, or network controller.

The local bus IDE interface on your system provides faster access to your hard disk drive. Your computer comes with special drivers that allow you to take advantage of this interface. The drivers may be already installed on your hard disk. Refer to the instructions at the end of Chapter 3 for more information about the local bus IDE drivers.

Video Card

Your computer (if purchased in the United States) comes with a high-resolution video card installed in one of the VESA option slots. Special drivers and utilities included with your card allow you to take advantage of extended VGA features such as high resolutions and 132-column text mode when you run popular application programs. These drivers may be already installed on your hard disk. Refer to the manual that came with your video card for more information about the drivers.

Optional Equipment

You can easily upgrade your computer by installing additional memory and a wide variety of options, as described below. (Installation instructions are provided in Chapters 4 and 5.)

System Memory

By adding 4MB or 16MB SIMMs (single in line memory modules) to the main system board, you can expand the computer's memory up to 40MB.

Cache Memory

You can add external cache memory to your system by having an Authorized EPSON Servicer install SRAM chips. You may have had external cache memory installed at the factory. Increasing the cache to 64KB, 128KB, or 256KB allows your system to access frequently used data much faster, improving overall system performance.

Microprocessor

You can enhance your system by replacing your processor chip with a faster processor. Following is a list of the processors you can use to upgrade your system:

- 486DX/ 33
- 486DX2/ 50
- 486DX/ 66
- SX2, DX4, and Pentium OverDrive processors, when available.

All DX- and Pentium-based processors include a built-in math coprocessor.

Drives

Your system supports up to three internal mass storage devices, including hard disk drives, diskette drives, a tape drive, a CD-ROM drive, or an optical drive.

How to Use this Manual

You don't have to read everything in this book to use your computer; see the following chapter summaries to find the sections you need.

Chapter 1 provides steps for setting up your system and connecting peripheral devices.

Chapter 2 describes how to run the SETUP program to define your computer's configuration. Do this the first time you use your computer and again if you change your configuration.

Chapter 3 covers general operating procedures, such as resetting the computer, entering a password, and changing the processor speed.

Chapter 4 describes how to install optional equipment such as interface cards, microprocessor upgrades, and memory modules.

Chapter 5 explains how to install and remove disk drives

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer.

At the end of this manual, you'll find a **Glossary,** an **Index**, and a list of international marketing locations.

Where to Get Help

If you purchased your computer in the United States or Canada, EPSON provides customer support and service through a network of Authorized EPSON Service Centers. EPSON also provides support services through the EPSON Connection.[SM] In the United States, dial (800) 922-4911. (You can also contact EPSON at (310) 782-0770 and ask for the EPSON Connection.) In Canada, dial (800) GO-EPSON.

Call the EPSON Connection for the following:

- ☐ Technical assistance with the installation, configuration, and operation of EPSON products
- ☐ Assistance in locating your nearest Authorized EPSON Reseller or Service Center
- ☐ Sales of accessories, manuals, or parts for EPSON products
- ☐ Customer relations
- ☐ EPSON technical information library fax service
- ☐ Product literature on current and new products.

When you call for technical assistance, be ready to identify your system and its configuration, and provide any error messages to the support staff. See Chapter 6.

If you purchased your computer outside the United States or Canada, contact your EPSON dealer or marketing location nearest you for customer support and service. International marketing locations are listed at the end of this manual.

If you need help with any software application program you are using, see the documentation that came with that program for technical support information.

CompuServe On-line Support

If you have a modem, the fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins for EPSON products is through the Epson America Forum on CompuServe.®

If you are already a CompuServe member, simply type **GO EPSON** at the menu prompt to reach the Epson America Forum.

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an EPSON product. This membership entitles you to:

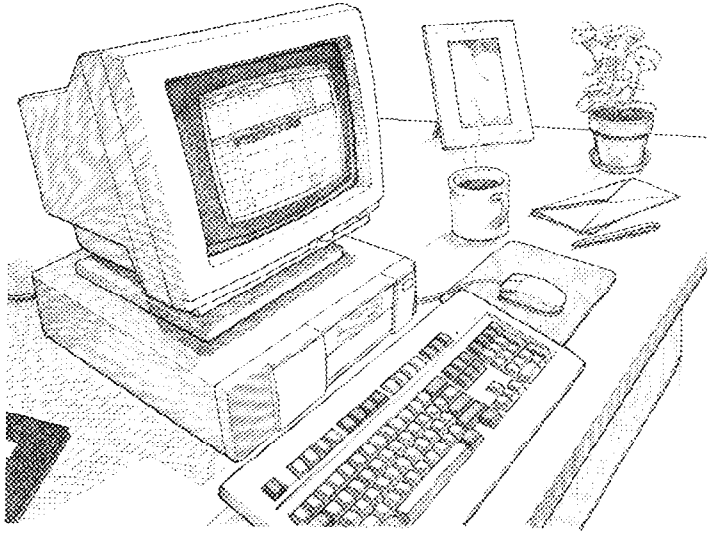
- ☐ An introductory $15 credit on CompuServe
- ☐ Your own user ID and password
- ☐ A complimentary subscription to *CompuServe Magazine,* CompuServe's monthly publication.

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call (614) 529-1611 (U.S. phone number) or call your local CompuServe access number.

Chapter- 1

Setting Up Your System

To set up your computer, follow the steps in this chapter. If you purchased additional options, see Chapters 4 and 5 for instructions on how to install them before you set up your system.

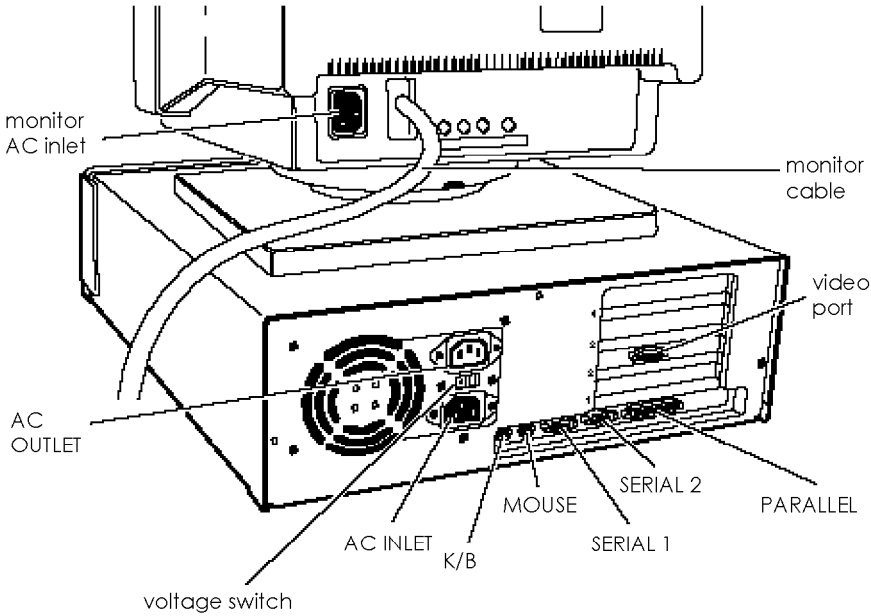


1 Choosing a Location

When selecting a place to set up your system, choose a safe, convenient location that provides the following:

- A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.
- Good air circulation. Leave several inches of space around the computer so air can move freely.
- Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other heat sources.
- No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.
- Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area. If you are operating the computer in a country other than the one in which you purchased it, see "Power Source Requirements" in Appendix A for the cord you should use.

When you are ready to connect the various parts of your system, use the following illustration to locate the ports on the back of the computer.



2 Connecting a Monitor

If your video card has not been installed already, you need to install it before you can connect a monitor. See Chapter 4 for instructions. Then follow these steps to connect your monitor to the video port on the card:

1. Place the monitor and computer so the backs are facing you.

2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to a power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now. (See your monitor manual for instructions.)

3. Align the connector on the monitor cable with the video port on the card installed in your computer; then insert the connector. Be careful not to bend the pins when inserting it.

4. If the connector has retaining screws, tighten them

5. Plug the monitor power cord into the monitor's power inlet.

6. Plug the other end of the power cord into an appropriate grounded electrical outlet, power strip, or surge protector.

3 Connecting a Printer or Other Device

Your computer has one parallel port and two serial ports. To connect a printer or other peripheral device, follow the instructions below.

Using the Parallel Port

Follow these steps to connect a parallel printer to your computer:

1. Place the printer next to the computer so that the backs are facing you.
2. Align the connector end of the printer cable with the PARALLEL port and plug it in. If the connector has retaining screws, tighten them.
3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.
4. Plug the printer's power cord into an appropriate grounded (earthed) electrical outlet, power strip, or surge protector.

Using the Serial Ports

If you have a printer, a modem, or other peripheral device with a serial interface, you can connect it to one of the serial (RS-232C) ports on the back of the computer. These ports use a DB-9P connector, so be sure you have a compatible cable.

To connect a serial device, insert the connector into one of the ports, marked SERIAL **1** and SERIAL 2. If you are connecting only one serial device, use the SERIAL **1** port.

4 Connecting the Keyboard

To connect the keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked **K/B.**

> **Caution**
> Although the connectors and ports for the keyboard and mouse are physically identical, they cannot be used interchangeably. Be sure to plug the keyboard connector into the keyboard *(K/B)* port or you could damage your system.

You can change the angle of the keyboard by adjusting the legs on the bottom. Turn it over and flip each leg upward until it locks into place. It is important to select the best angle so you will prevent wrist fatigue. (You may even want to purchase a wrist pad for further comfort.)

To lower the keyboard, press each leg back into its slot.

5 Connecting the Mouse

Your computer includes an auxiliary port for a PS/2 compatible mouse that uses a round, miniature DIN (6-pin) connector. If your mouse has this type of connector, you can connect it to the computer's built-in port.

> **Note**
> If your mouse requires a different interface, connect it to the built-in serial port or an option card that provides the interface. Your system will properly identify the location of your mouse.

To connect the mouse to the built-in mouse port, plug the connector into the port marked **MOUSE**

> **Caution**
> Although the connectors and ports for the mouse and keyboard are physically identical, they cannot be used interchangeably. Be sure to plug the mouse connector into the MOUSE port, or you may damage your system.

If your system has not already been configured, or if you purchased a mouse other than the one that came with the system, you may need to install a mouse driver. See your mouse manual for instructions.

6 *Connecting the Power Cord*

To connect the power cord, plug the female end into the AC power INLET on the back panel.

> **WARNING**
> To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

Plug the other end of the power cord into an appropriate grounded (earthed) electrical outlet.

7 *Turning On the Computer*

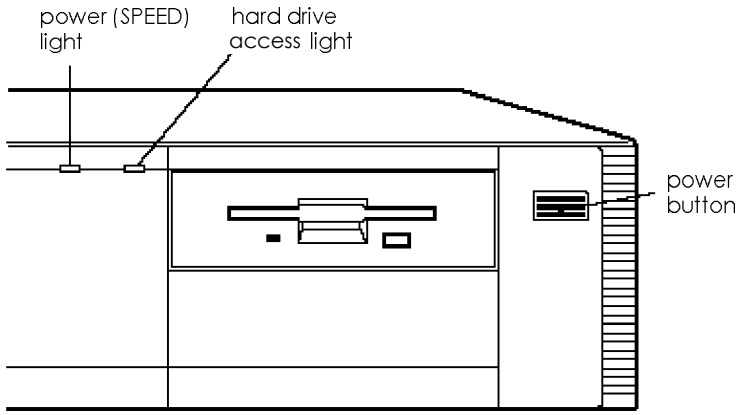
After you set up your system, you're ready to turn on the power. Check the following safety precautions to avoid accidentally damaging your computer or injuring yourself:

- ☐ Do not connect or disconnect any peripheral device cables (including the mouse or keyboard) or power cables unless the computer power is off.
- ☐ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on the disk.
- ☐ Never turn on the computer with a protective card in the diskette drive.
- ☐ Always wait about 20 seconds after you turn off the power before you turn it on again to prevent damage to the computer's electrical circuitry.
- ☐ Do not leave a beverage near your system. Spilled liquid can damage the circuitry.

Follow these steps to turn on the system:

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.
2. If there is a protective card in the diskette drive, remove it.
3. Turn on the monitor, printer, and any other devices connected to the computer.

4. To turn on the computer, press the power button on the right side of the front panel.



The power indicator on the left side of the front panel lights up. After a few seconds, the screen displays a count of the system memory, and then the computer performs a power-on diagnostics routine to make sure everything is working correctly.

5. If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen.

6. The screen displays the following prompt:

```
Press <Del> If you want to run SETUP
```

Do not press any key yet; you just want to make sure the computer is working. This prompt appears every time you turn on your computer so you can run SETUP if necessary After a few seconds, the prompt disappears.

If there is no operating system installed on your computer, you'll see an error message. Ignore the message for now; once you install the operating system, you will not see this message. If MS-DOS® is already installed, you may see the command prompt (*C:*) or the menu screen of a program such as Microsoft® Windows.™

Now you need to run SETUP to make sure your computer is configured properly. First turn off the computer, as described below, then see Chapter 2 for instructions. When you finish running SETUP, be sure to see "Post-SETUP Procedures" on page 2-18 for guidelines on what you need to do next.

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.
2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.
3. Remove any diskette(s) from the diskette drive(s)
4. Press the power button to turn off the computer.
5. Turn off the monitor, printer, and any other peripheral devices.

Chapter 2
Running the SETUP Program

The SETUP program defines how your system is configured. Although your system comes with the correct options predefined, it is a good idea to verify these options by running SETUP the first time you use your computer. You may also need to run it again later if you change your configuration.

SETUP is stored in the computer's read-only memory (ROM), so you can run it any time you turn on or reset your system. SETUP lets you verify or change the following:

- ☐ Current date and time
- ☐ Type of diskette drive(s) installed
- ☐ Type of hard disk drive(s) installed
- ☐ Type of video display adapter you are using
- ☐ Processor speed
- ☐ System booting sequence
- ☐ Diskette drive seek test
- ☐ System memory
- ☐ Coprocessor support
- ☐ Shadow ROM options
- ☐ Keyboard options
- ☐ Peripherals options
- ☐ Password options.

The configuration you define through SETUP is stored in a special area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Whenever you reboot the computer, it checks the settings, and if it discovers a difference between the information in the CMOS RAM and its actual hardware configuration, it prompts you to run SETUP. You see a message describing the error as well as the following prompt at the bottom of the screen:

```
Press <Fl> to run SETUP or RESUME
```

If this happens, press **F1** to run SETUP and correct the setting.

Another SETUP option displays information about your system board. This information provides a useful reference about jumper and DIP switch settings, SIMM configuration, and hot key combinations. See page 2-16 for more information.

SETUP also lets you restore the default values for your configuration. This is useful if you have made changes but don't want to keep them; you can restore all the default settings. See "Loading Default SETUP Values" on page 2-16.

Starting the SETUP Program

To start SETUP, make sure there is no diskette in the diskette drive; then turn on your computer. (If your computer is already on, turn it off, wait 20 seconds, and then turn it on again.) After the power-on diagnostics, you see the following prompt on the screen:

```
Press <Del> If you want to run SETUP
```

As soon as you see this message, press Delete.

If you do not press Delete within approximately five seconds, the computer starts loading the operating system and you will not be able to run SETUP. If this happens, reset the computer and try again. See Chapter 3 if you need instructions for resetting your computer.

When you press Delete, you'll see a SETUP menu containing these options:

1. **Start operating system**
2. **Run SETUP**
3. **Set password options**
4. **Display system board help**
5. **Load default SETUP value**
6. **SAVE settings and exit**
7. **Exit without saving setting**

Type the number of the menu option you want to select, or use ↑ or ↓ to move the cursor over the option you want to select and press Enter. As you highlight each menu selection, you'll see a description of the option at the bottom of the screen.

Entering SETUP Options

You can verify or change all SETUP functions except the password options from menu option **2, Run SETUP**. To select this option, press & to highlight it, then press Enter. You see the SETUP screen.

This screen displays the size of both the base and extended memory and whether a math coprocessor is installed. You also see a calendar for the current month at the bottom right of the screen.

Additionally, this screen contains system parameters you can change.

Selecting Options

A solid cursor bar highlights the selected parameter. Press ←, ↑, →, or ↓ to move the cursor to the parameter you want to change. Then press PgUp or PgDn to display the available options.

As you move the cursor to each parameter, you see a description of the available options for that parameter at the bottom of the screen.

The following sections describe how to choose the correct SETUP parameters for your system.

Setting the Date and Time

The real-time clock in your computer continuously tracks the date and time—even when the computer is turned off. Once you set the date and time using SETUP, you should not need to change them, unless you need to adjust the time for daylight savings or other seasonal adjustments. (The computer automatically changes the date for leap years.)

Use the cursor arrow keys to position the cursor over the portion of the date or time you want to change. Press PgUp or PgDn to modify the date or time. The time parameter uses a 24-hour clock. For example, 5 p.m. is shown as 17.

Setting the Diskette Drive(s)

Your system may have only one diskette drive installed or you may have a second drive of a different size or capacity. SETUP offers five possible selections for your diskette drives (A and B):

- ☐ 360KB, 5.25-inch
- ☐ 1.2MB, 5.25-inch
- ☐ 720KB, 3.5-inch
- ☐ 1.44MB, 3.5-inch
- ☐ 2.88MB, 3.5-inch
- ☐ Not Installed.

Check the settings for both drives and correct them if necessary. (If you have only one diskette drive or if you install a drive that does not use the diskette drive controller (for instance, an IDE or SCSI drive) in the lower bay, select **Not Installed** for **Diskette drive B.) If you install a** combination (dual) diskette drive, the top drive is A and the bottom drive is B.

Setting the Hard Disk Drive(s)

The SETUP program lets you select the type of hard disk drive(s) installed in your computer. If you have two hard disk drives, the first one is C and the second one is D. Be sure to choose the correct setting for both drives. Follow these guidelines:

- ☐ If you have only one hard disk drive, or if you installed a second drive that doesn't use the IDE controller, select **None** for **Hard disk D.**

- ☐ Select the drive type number that matches your drive. See "Hard Disk Drive Types" below.

Hard Disk Drive Types

The following table lists the types of standard hard disk drives you can use. Check this table and the documentation supplied with your hard disk to find the correct type number for your drive. If none of the types listed matches your drive, see "Defining Your Own Drive Type" on page 2-8

Hard disk drive types

Type	Cyln	Head	WPCom	LZone	Sec	Size (MB)*	EPSON drive
1	1048	16	65535	1048	63	516	
2	762	8	65535	762	39	116	CP30104H
3	1024	12	65535	1024	17	102	
4	940	8	512	940	17	62	
5	940	6	512	940	17	47	
6	903	8	65535	903	46	162	CP30174E
7	332	16	65535	332	63	163	
8	1024	12	65535	1024	34	204	
9	900	15	65535	901	17	112	
10	768	14	65535	768	62	326	
11	1024	16	65535	1024	63	504	
12	855	7	65535	855	17	50	
13	306	8	128	319	17	20	
14	1010	9	65535	1010	55	244	AC2250
16	612	4	0	663	17	20	
17	989	12	65535	989	35	203	AC1210
18	685	16	65535	685	38	203	
19	1023	13	65535	1023	50	325	
20	1010	12	65535	1010	55	325	AC2340
21	1010	6	65535	1010	55	163	AC1170
22	739	4	65535	739	40	58	
23	739	8	65535	739	40	115	

Hard disk drive types (continued)

Type	Cyln	Head	WPCom	LZone	Sec	Size (MB)*	EPSON drive
24	927	15	65535	927	17	115	
25	895	10	65535	895	55	240	CP30254
26	665	16	65535	665	63	327	CP30344
27	903	4	65535	902	46	81	CP30084E
28	826	16	65535	826	63	407	
29	1002	8	65535	1002	32	125	
30	967	16	65535	967	31	239	
31	790	15	65535	790	57	330	
32	683	16	65535	682	38	203	
33	901	5	65535	900	53	117	
34	723	13	65535	722	51	234	LPS240AT
35	980	10	65535	979	17	81	
36	1024	12	65535	1024	34	204	
37	925	9	65535	925	17	69	
38	1024	9	65535	1024	17	77	
39	767	14	65535	767	62	325	
40	820	6	65535	820	17	41	
41	1023	10	65535	1023	17	85	
42	1001	15	65535	1001	17	125	
43	978	14	65535	978	35	234	
44	919	16	65535	919	17	122	
45	1011	15	65535	1011	22	163	ELS170AT
46	828	10	65535	827	34	137	
47	USER TYPE						

* Actual formatted size may be slightly different than size on drive label

Defining Your Own Drive Type

If the parameters for your hard disk (listed in its documentation) do not match any of the types listed in the table above, you can define your own type. Follow these steps:

1. With the cursor on the drive you are defining, press PgUp until you see type 47.
2. Press → to move the cursor into the parameter fields.
3. Enter the appropriate values from the table below.

Drive type options

Heading	Description
Cyln	The number of cylinders on the drive
Head	The number of read/write heads in the drive
WPcom	The precompensation cylinder
LZone	The landing zone (the area on which the computer parks the heads)
Sec	The number of sectors on the drive

Press → after typing each number. Check your drive documentation for the correct value if SETUP does not accept a value you've typed. SETUP provides the hard disk size based on the other values you entered.

Setting the Primary Display Type

The **Primary display** option lets you define the type of adapter you are using for your primary display. If you connected your monitor to the port on the adapter card installed in your computer, select VGA/PGA/EGA. If you installed a different video card, check the following table for the correct adapter type.

Video display type options

Select	If
VGA/PGA/EGA*	You connected your monitor to the port on the VGA (or EGA) adapter card installed in your computer
Color 40x25	You installed an optional color graphics adapter that is set to 40-column CGA mode
Color 80x25	You installed a color graphics adapter (CGA) or a multi-mode graphics adapter (MGA) attached to a color monitor; be sure to set the color/mono switch on the MGA card to color
Monochrome	You installed a monochrome display adapter (MDA), an MGA, or a Hercules® MGA attached to a monochrome monitor; be sure to set the color/mono switch on the MGA card to mono

* Default setting

For a composite color monitor, such as a color television with video input, try selecting **Color** 80x25. If the monitor's resolution is poor, run SETUP again and select **Color** 40x25.

If you have two display adapters of different types, select the setting for the one you want to be your primary display adapter. The other one is your secondary adapter.

If you install one type of display adapter card and then change the adapter (from color to monochrome or vice versa), you may also need to change the setting of DIP switch 4. If you have two types of cards, set the DIP switch to match the adapter controlling your primary display. See Chapter 4 for instructions on changing DIP switch settings, and see the manual that came with your monitor for additional information.

Setting the Processor Speed

The **System speed** option lets you set the default speed for your system. When you select **Fast**, your system operates at your processor's highest speed. The **Slow** option simulates an 8 MHz processor to provide compatibility with older application programs.

At fast speed, your system can access memory faster, so your programs work faster. Select **Fast** unless you are using an application program that requires the slower speed. Check your software manual.

You can also change the speed temporarily by entering a keyboard command. See "Changing the Processor Speed" in Chapter 3 for more information.

Setting the Booting Sequence

The booting sequence determines the order in which the computer checks the drives when it looks for the operating system.

For example, if you select **A: then** C, each time you turn on the computer it checks drive A for an operating system diskette and loads the operating system from that diskette (if present). If drive A does not contain an operating system diskette, the computer loads the operating system from drive C. This is the default setting because you may sometimes want to boot the computer from a system diskette in drive A.

If you select **C: only**, the computer loads the operating system from drive C and does not check drive A. This setting allows the computer to load the operating system a little faster; however you will not be able to boot the computer from a diskette in drive A.

Setting the Diskette Seek Parameter

If you enable **Diskette seek test** option, the system checks for a diskette drive during its power-on diagnostics. If no diskette drive is connected, you see a diskette drive error. Disable this option if you want your system to boot when no diskette drive is connected.

Using the SETUP Screen Submenus

The SETUP screen contains three submenus that allow you to change these settings:

- Shadow ROM options
- Keyboard options
- Peripheral options.

To access the options on these submenus, move the cursor to **Shadow option**, **Keyboard setup**, or **Peripherals setup**. You see a window to the right of the screen listing the submenu options.

Press → to move the cursor into the window. Then press the arrow keys to move the cursor to the option you want to change. Press PgUp or PgDn to scroll through the available options.

Setting the Shadow Options

Your computer can access RAM (random access memory) faster than ROM (read only memory). The Shadow feature on your system automatically copies the contents of the system BIOS into RAM so your system can perform certain operations faster.

The first option allows you to shadow your video BIOS. Three additional options allow you to shadow 32KB at the memory addresses listed on the screen. You may want to enable one or more of these shadow features if, for example, you are using option cards that contain ROM; you can shadow the memory on the card to your system's RAM. Check the memory map on page A-10 and the documentation that came with your option card to determine which addresses your option card can access. You may also need to set some switches or jumpers on the option card.

Setting the Peripherals Options

The **Peripherals setup** option lets you change the settings for the built-in interface ports and disk drive controllers. You may need to change these settings if you install an interface on an option card. The following table lists the possible settings.

I/O control options

Peripherals option	Setting	Description
Parallel	U-LPT1	Sets parallel port as unidirectional LPT1
	U-LPT2	Sets parallel port as unidirectional LPT2
	U-LPT3	Sets parallel port as unidirectional LPT3
	Bi-LPT1*	Sets parallel port as bidirectional LPT1
	Bi-LPT2	Sets parallel port as bidirectional LPT2
	Bi-LPT3	Sets parallel port as bidirectional LPT3
	Disabled	Disables on-board parallel port
Serial	COM1 + 2*	Sets serial port 1 as COM1 and serial port 2 as COM2
	COM2	Sets serial port 1 as COM2 and disables port 2
	COM1	Sets serial port 1 as COM1 and disables port 2
	Disabled	Disables both serial ports
PS/2 mouse	Enabled*	Enables PS/2 mouse port
	Disabled	Disables PS/2 mouse port

I/O control options (continued)

Peripherals option	Setting	Description
On-B/D FDC	Enabled* Disabled	Enables on-board diskette drive controller Disables on-board diskette drive controller
IDE HDC	Enabled* Disabled	Enables on-board hard disk drive controller Disables on-board hard disk drive controller

* Default setting

Setting the Keyboard Options

There are four options for the keyboard: **`Test`**, **`NumLock`**, **`Key rate`**, and **`Key delay`**. The table below describes the settings available.

Keyboard options

Option	Settings	Description
Test	Enabled* Disabled	Tests keyboard at power-on Skips keyboard test at power-on
NumLock	On* Off	Determines initial NumLock status when system is turned on or reset
Key rate	2.0-30.0 (characters per second)	Sets rate at which a character repeats when key is held down; default is 10.9
Key delay	0.25-1.00 (seconds)	Sets period of delay between the time a key is pressed and the character appears on the screen; default is 0.50

* Default setting

Setting the Password Options

SETUP lets you enter a new password or disable an existing password to control who can access your system. A second password option allows you to set a hot key to disable your keyboard and mouse until you enter your system password

Entering a Password

Follow these steps to enter a password:

1. Select option 3, Set **Password options**, from the main menu.

2. Press PgDn until you see **New Install** displayed for the **Password state** option. The cursor moves to the **Enter password** option field.

3. Type the password you want to use and press Enter. The password can be up to eight characters and/ or numbers. As you type the password, the screen displays an asterisk for each character you type.

4. The cursor moves to the second **Enter password** option field. Type your password again and press Enter. You again see an asterisk for each character you type. If you enter the same password correctly, you see the message:

   Correct! password installed

   If you enter the password incorrectly, you see the message:

   Incorrect! not installed

   You must retype the password correctly.

5. As you exit SETUP, make sure you save the new settings When the system reboots, you see the password prompt.

Changing or Deleting a Password

If you want to change your password, follow the same steps as to enter a new one. When the cursor is at the **Enter password** option, type the new password you want to use.

To delete a password, select **Not Installed** for the **Password state** option.

Whenever you delete your password using SETUP, make sure you save the new settings as you exit the SETUP program.

Setting the Keyboard Lock Option

SETUP provides another level of security for your system in the keyboard lock function. Once you have set a password, you can also define a combination of keystrokes (or hot key) that will lock your keyboard and mouse. You will have to enter your password again to unlock the keyboard.

Follow these steps to define the hot key for your keyboard lock option:

1. On the password setup screen, move the cursor to the **Hot key state** option.
2. Press PgDn until you see **New Install.** The cursor moves to the **Enter** 'Hot key' option field.
3. Enter a letter or a number and press Enter. This identifies the key you want to press together with **Ctrl** and **Alt as** the hot key to lock your keyboard.
4. As you exit SETUP, make sure you save the new settings. When you press the hot key you've defined, the keyboard and mouse lock until you enter your password.

Using the System Board Help Function

SETUP provides a system board help function that contains a diagram of your system board in addition to the following information :

- DIP switch settings
- Jumper settings
- Identification of connectors
- Correct SIMM configurations
- External cache configurations
- Hard disk drive types
- System key combinations.

To use this help function, select option 4, **Display system board help,** from the main menu. Use the arrow keys to scroll through the options. You see the help information for the selected option in a window at the lower right corner of the screen.

Loading Default SETUP Values

You can load the default SETUP values at any time by selecting option 5, **Load default SETUP value**. When you select this option, you see this message:

```
Load BIOS SETUP default value (Y/N)?
```

Press Y, then Enter to load the default values. If you don't want to load the default values, press **N,** then Enter. You can select another option from the SETUP main menu, or exit SETUP.

Saving Your Settings and Exiting SETUP

When you leave SETUP, you can either save the settings you have changed or exit the program without saving any changes.

To save your settings, follow these steps:

1. Press Esc to return to the main SETUP menu.
2. Select option 6, **SAVE settings and exit**, and press Enter. You see this message:

   Write to CMOS RAM and exit (Y/N)?

3. Press Y and Enter. The system reboots.
4. If you have just run SETUP for the first time, see "Post-SETUP Procedures," below.

To exit SETUP without saving the settings, select option 7, **Exit without saving setting**. The system reboots with your original settings.

> *Note*
> If your computer detects a problem in your SETUP configuration, you may see an error message and a prompt to run SETUP when it is rebooting. Follow the instructions on the screen to run SETUP and correct the problem.
>
> You may also see an error message when your computer is rebooting if you have not installed your operating system on the hard disk and you did not insert a system diskette in drive A. If you receive this error message, follow the instructions in your operating system manual to install it.

Post-SETUP Procedures

If you have just run SETUP for the first time and your system has not been configured, you now need to install the operating system on your computer. See your operating system manual for instructions.

After you have installed the operating system, you can install any software you plan to use, including Windows and any other programs. See your application program manuals for instructions.

The VGA adapter card in your computer comes with special drivers to enhance the display capabilities of your monitor with certain applications. Refer to the manual that came with your video card for more information about these drivers. (If the video card was installed in your computer when you purchased it, the drivers may already be installed on your hard disk.)

Your system also comes with special IDE drivers that allow you to take advantage of the high-speed local bus hard disk drive interface. The drivers may already be installed on your system. They can also be installed from the Utility diskette, following the instructions at the end of Chapter 3.

Chapter- 3

Using Your Computer

This chapter briefly describes the following operations:

- Working comfortably
- Inserting and removing diskettes
- Stopping a command or program
- Resetting the computer
- Using a password
- Using the hot key feature
- Changing the processor speed
- Installing the local bus IDE drivers.

Working Comfortably

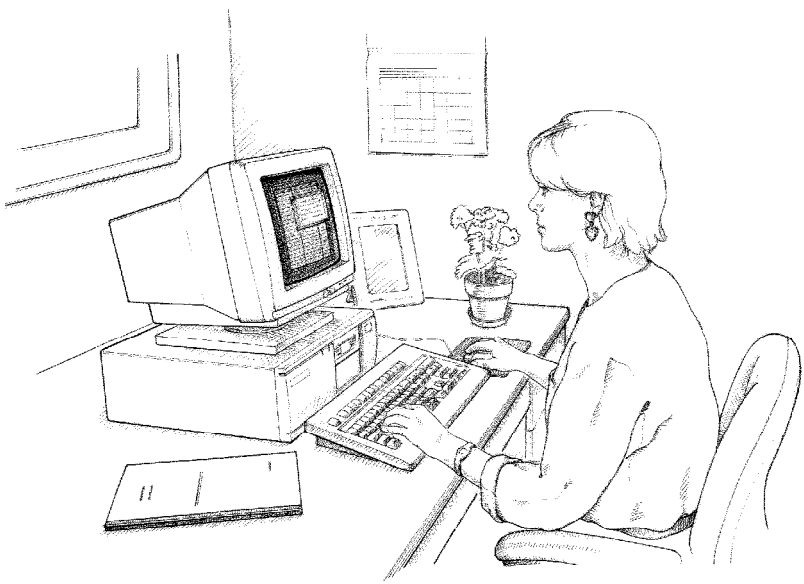
This section provides tips for creating a comfortable work environment. Following these guidelines for good posture, work habits, and workstation layout can help you avoid problems such as muscle aches, eyestrain, and fatigue.

Sitting at Your Computer

When you use the computer, try to keep your elbows, hips, and knees bent at approximately 90 degree angles and keep your wrists as close to horizontal as possible. (Your hands, forearms, and thighs should be horizontal and your upper arms and lower legs should be vertical.) Your feet should rest firmly on the floor or a footrest.

An adjustable chair allows you to customize your workstation for your body so you can maintain the right posture. To avoid back problems, make sure your chair supports your lower back. Padded armrests let you rest your arms as you work.

To reduce neck strain, keep source documents on a copy stand and position the stand next to the screen at the same eye level.



Work in a relaxed, natural, upright position and let the chair support you. Your elbows should be near your body and level with or slightly lower than the keyboard so your hands rest lightly on the keys. To help you keep your wrists straight, the slope of the keyboard should be no more than 25 degrees. Try not to hit the keys too hard; using too much force creates tension in your hands. Also leave enough room on your work surface so you can freely move the mouse (or other pointing device), and be sure to rest your hands occasionally.

Varying Your Posture and Movements

While sitting at the computer, try to vary your posture and movements. Your seat and backrest should be wide enough and there should be enough room under your desk so that you can sit in a variety of positions throughout the day.

Be sure to occasionally stop working at your computer and perform other tasks. Also take periodic breaks; stand up, stretch, and move around.

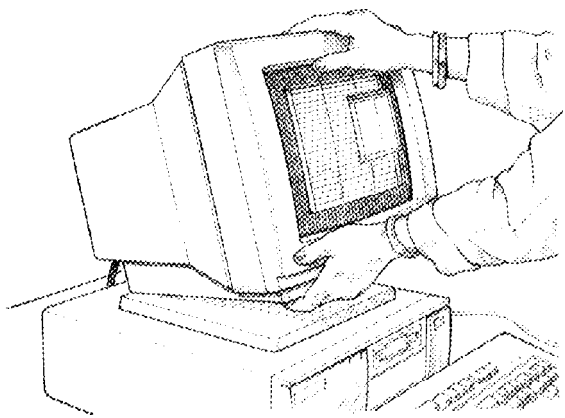
Lighting the Room

While it is important to have adequate lighting in your work area, make sure it is not too bright. When a light source is very bright, your eyes get tired by having to continually readjust between the relative dimness of the screen and the bright surroundings. It is best to control the amount of daylight that enters the room and keep bright light sources out of your field of vision when you are looking at the screen.

Positioning and Viewing the Monitor

Place the monitor directly in front of you and sit about an arm's length away from it. To minimize glare and reduce eye fatigue, position the monitor so that sunlight, desk lamps, and overhead lights do not shine directly on the screen.

When you are sitting in front of the monitor, the top of the screen should be slightly below eye level so you look down, rather than up, at the screen. If your monitor is too low, you can raise it by placing it (or the computer) on a stand. If the monitor has a tilt and swivel base, you can use it to adjust the position of the screen for comfortable viewing.



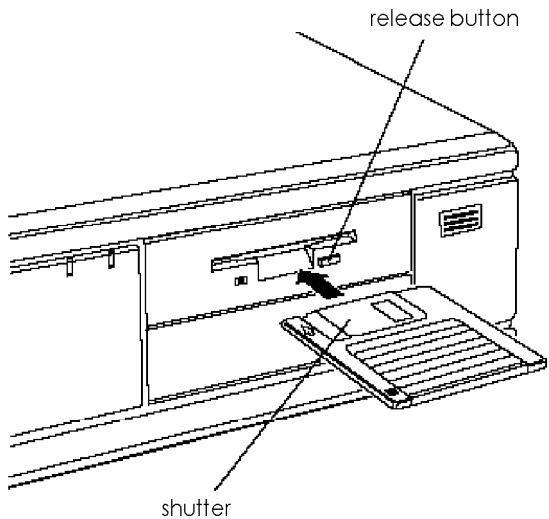
To produce an image that is clear and easy to look at, adjust the monitor's brightness and contrast controls. If your screen flickers, you can minimize it by selecting a dark background using the brightness and contrast controls or your software.

To prevent eyestrain, rest your eyes occasionally by closing them or focusing on a fixed spot in the distance.

Once you get in the habit of working comfortably, you'll be more productive than ever!

Inserting and Removing Diskettes

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.



To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/ write slot leading into the drive.

When you want to remove a diskette, make sure the drive light is off; then press the release button or flip up the latch. When the diskette pops out, remove it and store it properly.

> **Caution**
> Never remove a diskette or reset or turn off the computer while a diskette drive light is on. You could lose data. Also, remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered an MS-DOS or application program command that you want to stop, try one of the following:

- Press Pause
- Hold down the **Ctrl** key and press C
- Hold down the **Ctrl** key and press Break.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's current settings or its memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does not respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only when necessary.

> Caution
> Do not reset the computer to exit a program. Some programs classify and store new data when you exit them in the normal manner. If you reset the computer without properly exiting a program, you may lose data.

To reset the computer, the operating system must be either on the hard disk or on a diskette in drive A. If you are using MS-DOS, hold down **Ctrl** and **Alt and** press Delete. The screen goes blank for a moment and then the computer should reload your operating system.

If resetting the computer does not correct the problem, you probably need to turn it off and reboot it. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If you do not have a hard disk, insert the system diskette in drive A. Then turn on the computer.

Using a Password

If you set a system access password when you ran the SETUP program, you must enter it every time you turn on or reset the computer. Follow these steps to use your password:

1. If you do not have a hard disk, insert your system diskette in drive A.
2. Turn on or reset the computer. You see the following prompt:

   ```
   Enter Password:
   ```

3. Type your password and press Enter

If you type the password incorrectly, the computer will beep and allow you to retype it. After you type the password correctly and press Enter, the computer loads the operating system and displays the command prompt.

> *Note*
> If you do not know the correct password, see "Password Problems" in Chapter 6.

Using **the Hot** *Key* **Feature**

Once you set a password, you can keep unauthorized users from accessing your system by using the hot key feature. This key combination **(Ctrl** + **Alt** + the key of your choice) temporarily locks your keyboard and mouse so you can secure your system without turning it off.

To use the hot key feature, follow these steps:

1. Run SETUP to set your password and define a hot key. (See Chapter 2 for instructions.)

2. When you want to disable the keyboard and mouse, enter your hot key combination. The keyboard and mouse lock up and do not respond to typed entries or mouse movement.

3. To resume activity, type your password and press Enter.

Changing or Deleting a Password

To change or delete your password, you must run the SETUP program and follow the instructions for entering a password in Chapter 2.

If you forget your password, see "Password Problems" in Chapter 6.

Changing the Processor Speed

Your computer's processor can operate at two speeds: fast or slow. Fast speed is the highest speed at which your microprocessor is capable of running. Slow speed simulates an 8 MHz processor to provide compatibility with older application programs.

When your computer is operating at fast speed, the power light on the front panel is green. When the computer is operating at slow speed, the light is amber.

You should use fast speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Additionally, some copy-protected programs require the computer to run at slow speed while accessing the program on a diskette. These programs also usually require you to leave a key disk—the diskette that contains the copy protection—in the diskette drive. If you use a copy-protected program, you can change the speed to slow to access the diskette and return it to fast speed when you are finished.

If you want your computer to always start at slow speed, you can change the default setting through SETUP. See Chapter 2 for instructions.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard:

- To select slow speed, press **Ctrl Alt -.**
- To select fast speed, press **Ctrl Alt +.**

(Hold down the **Ctrl** key and the **Alt** key simultaneously and then press the + or – key on the numeric keypad.)

> **Note**
> You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed. You can, however, enter the command at the MS-DOS command prompt or change it through the SETUP program.

The speed setting remains in effect until you reset the computer, change the speed with a keyboard command, or change the speed using SETUP.

Local Bus IDE Drivers

These drivers allow you to take advantage of the high-speed local bus IDE interface on your computer, which provides faster access to your hard disk drive. The drivers may already be installed on your system. They can also be installed from the Utility diskette.

Follow these steps to install the IDE drivers:

1. Insert the Utility diskette in drive A
2. From DOS, log onto drive A
3. Type the following and press Enter:

   ```
   INSTALL2
   ```

4. Follow the instructions on the screen to install IDE drivers for DOS and/ or Windows on your hard disk.

After installing the drivers, the system reboots.

> *Note*
> Although you can use the IDE drivers with any EPSON-supplied hard disk, you may not be able to use them with hard disk drives from other vendors. To take advantage of the local bus IDE interface, your hard disk drive must support a 32-bit data path that utilizes double-word I/O. See the hardware specifications for your drive or contact the vendor of the drive and request a product specification.

Chapter- 4
Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as memory modules, ISA or VL-Bus option cards, or a microprocessor upgrade.

This chapter describes how to install and remove these options, as well as how to change the jumper and DIP switch settings inside the computer. You may need to change these settings if you install options or if you want to change the way your system operates.

How to Use This Chapter

This chapter explains how to do the following:

- ☐ Remove and replace the computer's cover
- ☐ Change jumper and DIP switch settings on the main board
- ☐ Install and remove memory modules (SIMMs)
- ☐ Install and remove an option card
- ☐ Remove and replace the option card connector board
- ☐ Install a new microprocessor chip

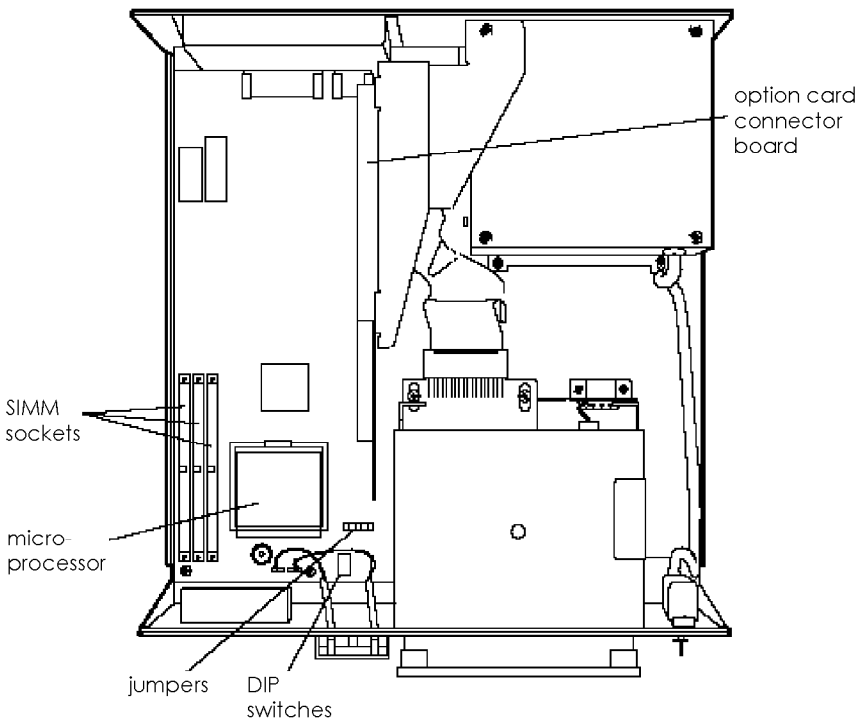
Follow the steps in the first section to remove the cover, then go to the appropriate section for the instructions you need. When you finish, see the instructions at the end of this chapter to replace the computer's cover.

Use the illustrations in this chapter as guidelines for installing options. The sockets on your system may look different than the ones illustrated here. Make sure you align your options as described in the text.

> *Note*
> Your system also supports up to 256KB of external cache memory; however, the system board must be removed from the computer to install the cache memory chips. If you want to add cache memory, contact your sales representative, Authorized EPSON Servicer, or the EPSON Connection for a referral. Do not attempt to install cache chips yourself.

Locating the Internal Components

As you follow the instructions in this chapter, refer to the following illustration to locate the different components inside your computer



Removing the Cover

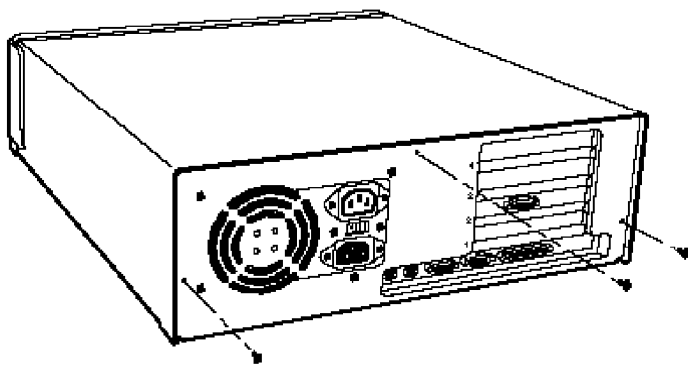
You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 5). Follow these steps:

1. Turn off the computer and then any peripheral devices (including the monitor and printer).

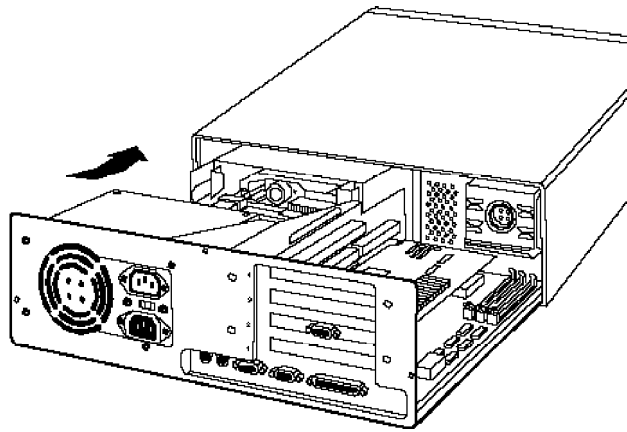
2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any cables that are connected to the computer, including the keyboard and mouse cables.

3. If the monitor is on top of the computer, lift it off and set it to one side.

4. Remove the three screws securing the back panel, as shown below.



5. From the front of the computer, grasp the sides of the cover and pull it straight toward you until it stops, just before it reaches the front of the computer. Then lift it off at an angle as shown below.



6. Set the cover aside.

7. Ground yourself to the computer by touching the metal surface of the back panel.

> WARNING
> Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

Changing the Jumper and DIP Switch Settings

The main system board in your computer has a number of jumpers and DIP switches. These devices control the operation of your system and provide configuration information to your CMOS ROM.

The jumpers control the following functions:

- Specify the type of CPU installed
- Specify the amount of external cache.

The DIP switches control the following functions:

- Select the processor speed
- Specify the type of CPU installed on your system board
- Indicate the use of external cache
- Enable or disable the password
- Specify a color or monochrome monitor.

Jumpers and DIP switches are preset at the factory to match your system's configuration, but you may need to change them when you install options or want to change some functions. The following tables list the jumpers and DIP switches you may need to change. Note that some of the jumpers on your board do not get changed.

CPU jumper settings

Jumper	Setting	Function
J1*	A B	Select DX, DX2, DX4, or Pentium OverDrive CPU Select SX or SX2 CPU

* Factory set according to system CPU

External cache jumper settings

Cache size*	J4	J5	J6	J7
OKB	A	A	A	A
64KB	A	A	A	B
128KB	B	A	B	A
256KB	B	B	A	B

* Factory setting; based on amount of external cache installed, if applicable

Clock speed DIP switch settings

Clock speed*	Switch 1	Switch 2	Switch 3
25 MHz	OFF	OFF	ON
33 MHz	ON	ON	OFF

* Factory set according to processor type

Other DIP switch settings

Switch	Setting	Function
4	ON OFF*	Disable password security feature Enable password security feature
5	ON* OFF	Select color monitor Select monochrome monitor
6**	ON OFF	External cache installed External cache not installed
7	Reserved for future use	

* Factory setting

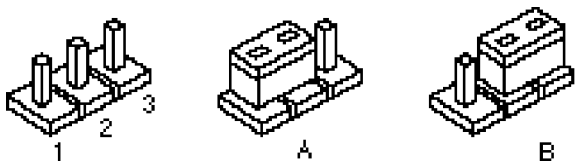
** Factory setting based on whether external cache is installed

Setting the Jumpers

If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 4-3 to locate the jumpers at the edge of the system board.

2. A jumper's setting is determined by where the jumper is placed on the pins. For three-pin jumpers, the jumper connects pin 1 and the middle pin (position A) or pin 3 and the middle pin (position B), as shown below.



   You can also set a jumper to the off position by placing it on only one of the end pins.

3. To move a jumper from one position to the other, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

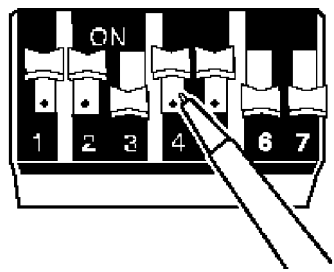
> **Caution**
> Be careful not to bend the jumper pins or damage any surrounding components on the main system board.

Setting the DIP Switches

If you need to change any of the DIP switch settings, follow these steps:

1. Locate the DIP switch block at the edge of the system board, shown on page 4-3. The switches are numbered 1 through 7, and the ON position is marked on the block.

2. Use a pointed instrument, such as the tip of a pen, to turn a DIP switch on or off. The new setting takes effect the next time you turn on the computer.



3. Depending on which DIP switch you change, you may also need to run SETUP. For example, if you set DIP switch 4 to OFF to enable password security, you then need to enter your password using Set **Password options** in SETUP. See Chapter 2 for instructions.

Memory Modules (SIMMs)

Your computer comes with 4MB of memory soldered on the system board. By installing memory modules—also called SIMMs--you can increase the amount of memory in your computer up to 40MB.

There are three SIMM sockets on the main system board, and each can contain one memory module. You can install SIMMs with a capacity of 4MB or 16MB. The following table shows the possible SIMM configurations; do not install memory in any other configuration.

SIMM configurations

SIMM 1	SIMM 2	SIMM 3	Total
0	0	0	4MB*
4MB	0	0	8MB
4MB	4MB	0	12MB
4MB	4MB	4MB	16MB
16MB	0	0	20MB
4MB	16MB	0	24MB
16MB	16MB	0	36MB
4MB	16MB	16MB	40MB

* Standard memory on the system board

Before you install SIMMs, observe the following guidelines to ensure that they will work properly:

- Use only 32- or 36-bit, 72-pin, tin-plated, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.

- Your computer can use any SIMM that complies with industry standards; however, it is best to use SIMMs recommended or supplied by EPSON to ensure reliability and compatibility.

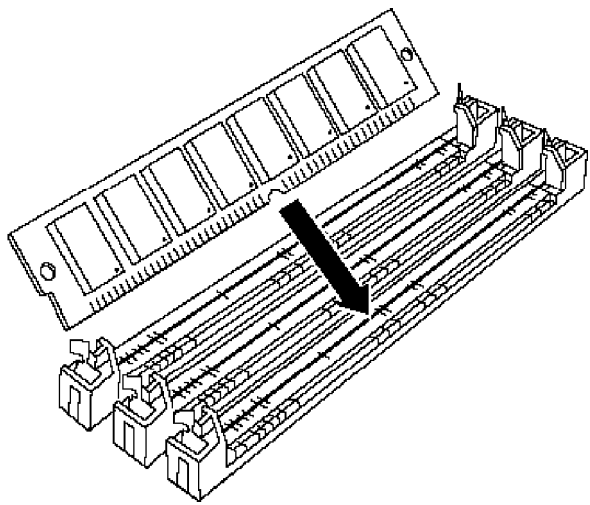
Inserting SIMMs

Follow these steps to install SIMMs:

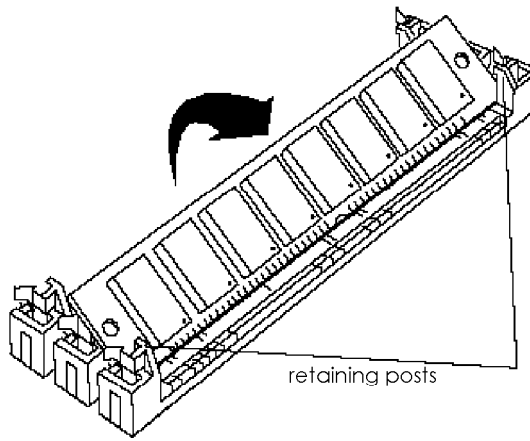
1. Refer to the illustration on page 4-3 to locate the SIMM sockets near the front of the computer.

2. Remove any option card that may be blocking your access to the SIMM sockets. See page 4-16 for instructions.

3. Position the SIMM over the socket at an angle, as shown below. The components on the SIMM should face the outside of the computer.



4. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown below, guiding the hole at each end of the SIMM over the retaining post at each end of the socket.



If it does not go in smoothly, do not force it; pull it all the way out and try again.

5. Repeat steps 3 and 4 for the second and third SIMM, if necessary.

6. Replace any option card you removed. See page 4-14 for instructions.

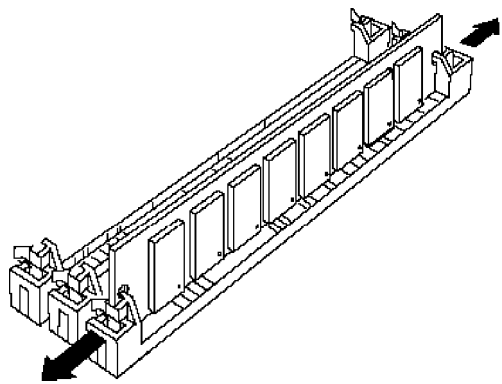
7. The next time you turn on your computer, run the SETUP program so your computer can update its configuration information with the new memory. See Chapter 2 for instructions.

Removing ***SIMMs***

If you need to remove SIMMs from your computer (to install different ones, for example), follow the steps below:

1. Remove the video card and any option cards that may be blocking your access to the SIMM sockets. See page 4-16 for instructions.

2. Use your fingers or a small screwdriver to carefully release the metal tabs that secure the SIMM at each end. As you release the tabs, the SIMM falls to the side. Remove it from the socket.



3. If necessary, follow the same procedure to remove the other SIMMs.

4. Replace the video card and any option cards you removed, as described on page 4-14.

5. The next time you turn on your computer, run the SETUP program so your computer can update its memory configuration.

Installing an Option Card

This section explains how to install an option card. Your computer has four expansion slots: two for 8-bit or 16-bit ISA option cards (slots 1 and 4) and two for 32-bit VL-Bus cards (slots 2 and 3). The VESA slots can also be used for ISA option cards; however, you will not be able to use the high-speed VESA interface with an ISA card. One of your VESA slots may be occupied by the video card that came with your computer.

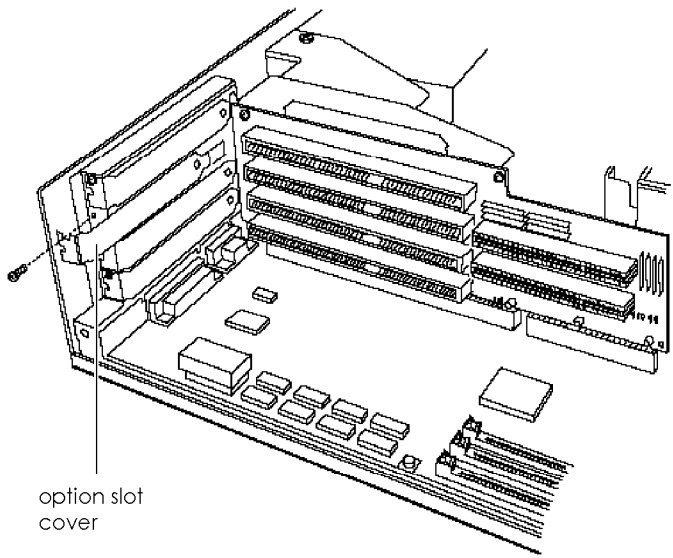
Follow these guidelines when deciding which slot to use:

- If you are installing a display adapter card, make sure any switches or jumpers on the card are set properly. See the documentation that came with the card for instructions.
- Although you can install an ISA option card in any of the four slots, you can only install a VESA card in slot 2 or 3. Make sure you know what type of card you are installing.
- If you installed SIMMs, the bottom slot (slot 1) will accommodate only a half-length card.
- In order to access the bottom slot, you may have to remove the VGA adapter card and then reinstall it. See page 4-16 for instructions on removing a card.
- If you are using a monochrome or CGA adapter and monitor, you also need to set the **Primary display** option in SETUP. See Chapter 2 for instructions on running SETUP.

> *Note*
> Before you install an option card, see if you need to change any jumper settings or DIP switches on the system board. For example, if you install a video card to use with a monochrome monitor, you may need to change DIP switch 5. See page 4-7.

Follow these steps to install an option card:

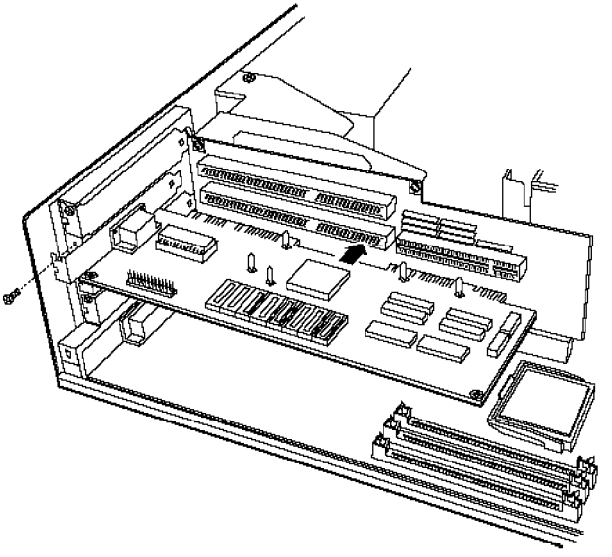
1. If you are installing a card in the option slot for the first time, you need to remove the metal cover for that slot on the inside back panel. Remove the retaining screw securing the metal cover to the computer. (Keep the screw to secure the option card to the computer.)



2. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)

3. Unpack the option card and adjust any switches or jumpers on it, if necessary. (Check the option card instructions.) When you handle the card, do not touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.

4. Hold the card along the top corners and guide it into the connector, as shown below.



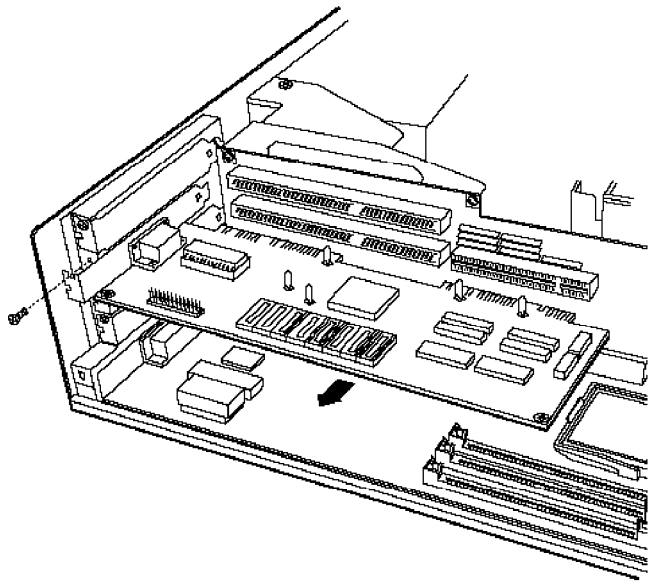
Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull it all the way out and try again.

5. Secure the end of the card to the computer with the retaining screw.

Removing an Option Card

You may need to remove an option card installed in your computer to access components on the main system board—to change the microprocessor, for example. You may also want to remove a card if you no longer need it. Follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.



2. Set the card aside with the component side facing up.

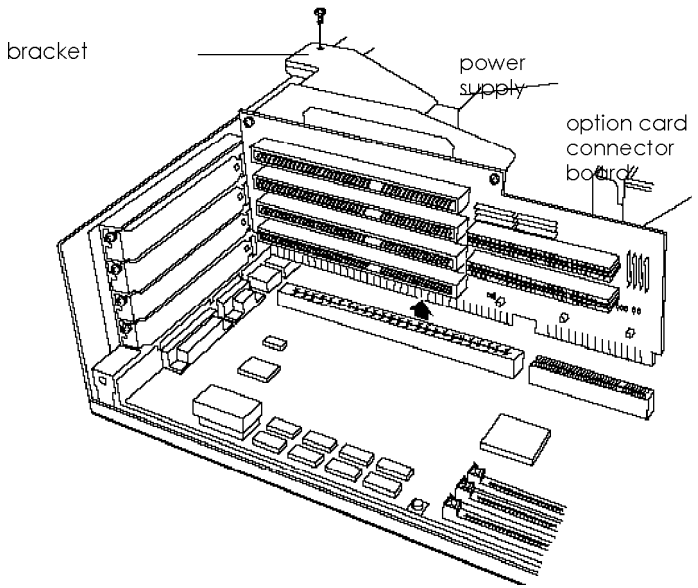
When you are ready to re-install the option card, see page 4-14 for instructions.

Removing the Option Card Connector Board

You may want to remove the option card connector board to access certain components on the main system board, such as the disk drive connectors. Follow these steps:

1. Remove the video card and any option cards. (See the instructions above.)

2. Remove the retaining screw securing the bracket on the option card connector board to the power supply.



3. Pull the board straight up and out of its socket and set it aside

Replacing the Option Card Connector Board

If you removed the option card connector board, refer to the illustration on page 4-14 as you follow these steps:

1. Position the board above its slot and then firmly push it straight in.

2. Secure the board to the power supply with its retaining screw.

Now you can re-install the video card and any option cards you removed. See page 4-14 for instructions.

Upgrading the Microprocessor

You can increase your system's speed by installing a new microprocessor chip: your system supports SX, SX2, DX, DX2, DX4, or Pentium OverDrive processors.

You can purchase upgrade kits from EPSON or buy the individual components separately. Complete instructions for installing the processor are provided in the manual that comes with it. Please follow those instructions carefully, along with the following guidelines:

- Refer to the illustration on page 4-3 to locate the microprocessor socket on the system board. You can install the new processor directly in this socket; however, you need to remove the current microprocessor first. To remove the microprocessor chip, follow the instructions on page 4-20.

- You'll need to remove any video card or other option cards that block your access to the microprocessor socket before you remove the existing processor to install the new chip. You can replace the card or cards after the new processor is installed.

- When you upgrade an SX-based processor to a DX- or Pentium-based processor, you need to change the jumper setting of J1 to position A.
- You may need to change DIP switch settings to match the speed of your new processor. See page 4-7 for more information.
- For SX2, DX, DX2, DX4, or Pentium OverDrive processors, you need to install a heat sink on the chip.
- After you install the processor and replace the computer's cover, run the SETUP program so your computer can update its configuration. See Chapter 2 for instructions. (You need only run the program and save the configuration; you do not need to change any settings.)

Replacing the Microprocessor

Follow these steps to replace the microprocessor chip in your computer:

1. Remove any video card or other option cards that may be blocking your access to the microprocessor socket. See page 4-16.
2. Use the illustration on page 4-3 to locate the microprocessor on the system board. The microprocessor chip is inserted in a ZIF (Zero Insertion Force) socket.

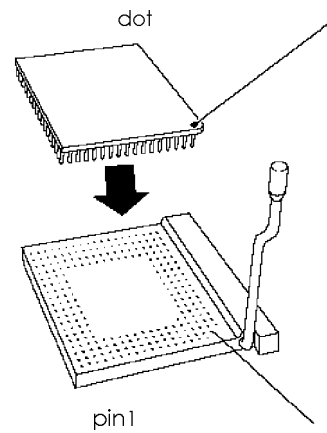
> **Caution**
> Make sure you ground yourself by touching the metal surface on the inside of the computer's back panel before you touch the processor chip. Then remain as stationary as possible while you install it. Do not touch the pins on the processor chip. Handle the microprocessor only by the edges of its case.

3. Open the ZIF socket by lifting up the ZIF handle to release the chip from the socket. If the socket has a lever-type handle, press the handle down and away from the tab; then rotate the handle to the released position. If the socket has a basket-type handle, rotate the handle over the processor. If the existing processor has a heat sink, you may need to remove the heat sink before you can open the ZIF socket.

4. Gently pull the processor chip straight up and set it aside.

5. Remove the replacement chip from its package and inspect the pins. If they are bent, do not install the processor chip. Contact your vendor for a replacement.

6. Position the processor chip over the ZIF socket, aligning the notched edge of the chip (marked with a dot) with pin 1 on the socket. A notch drawn on the system board identifies pin 1 in the socket.



Note
If you install the processor chip in the wrong position, you may burn the chip and void your warranty.

7. Make sure the pins in the processor chip are directly over the holes in the socket. Then gently push the microprocessor straight into the socket.

8. Secure the chip in the socket by pressing the ZIF handle back to the closed position.

9. If you are installing SX2, DX, DX2, DX4, or Pentium OverDrive processors, you must install a heat sink on the chip. Follow the instructions that came with the heat sink or processor.

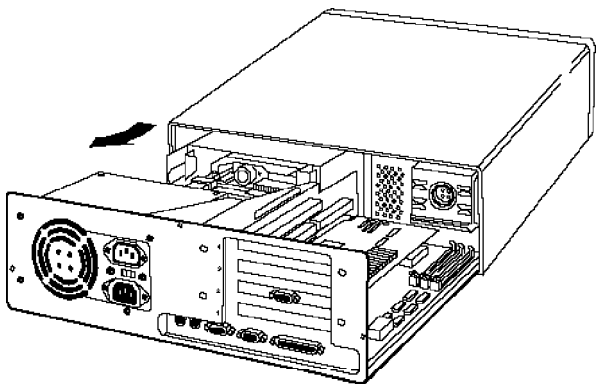
10. If you are upgrading from an SX-based processor to a DX- or Pentium-based processor, you need to change the jumper setting of J1 to position A. You may also need to change DIP switch settings to match the speed of your new processor. See the table on page 4-7 for more information.

11. Replace your video card and any other option cards you removed. See page 4-14 for instructions.

Replacing the Cover

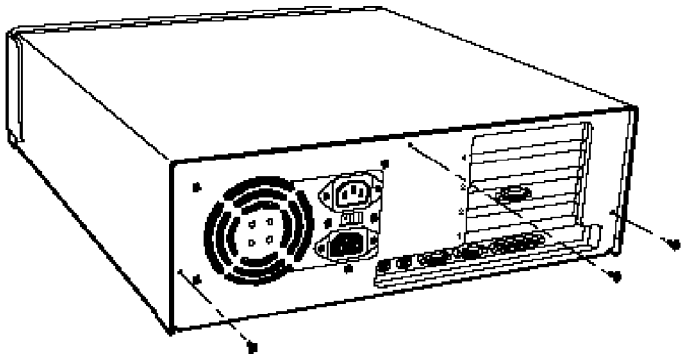
When you are ready to replace the computer's cover, follow these steps:

1. Facing the front of the computer, position the cover so the lip on its bottom edge slides under the guiderails along both sides of the computer case, as shown in the following illustration.



2. Lower the cover and slide it straight back over the computer until it cannot go any farther.

3. Replace the three cover retaining screws, as shown below.



4. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

Post-installation Procedures

After you install or remove options such as memory modules or a new processor, you must run SETUP to update the computer's configuration. See Chapter 2 for instructions.

You may also need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment for instructions.

Chapter- 5
Installing and Removing Drives

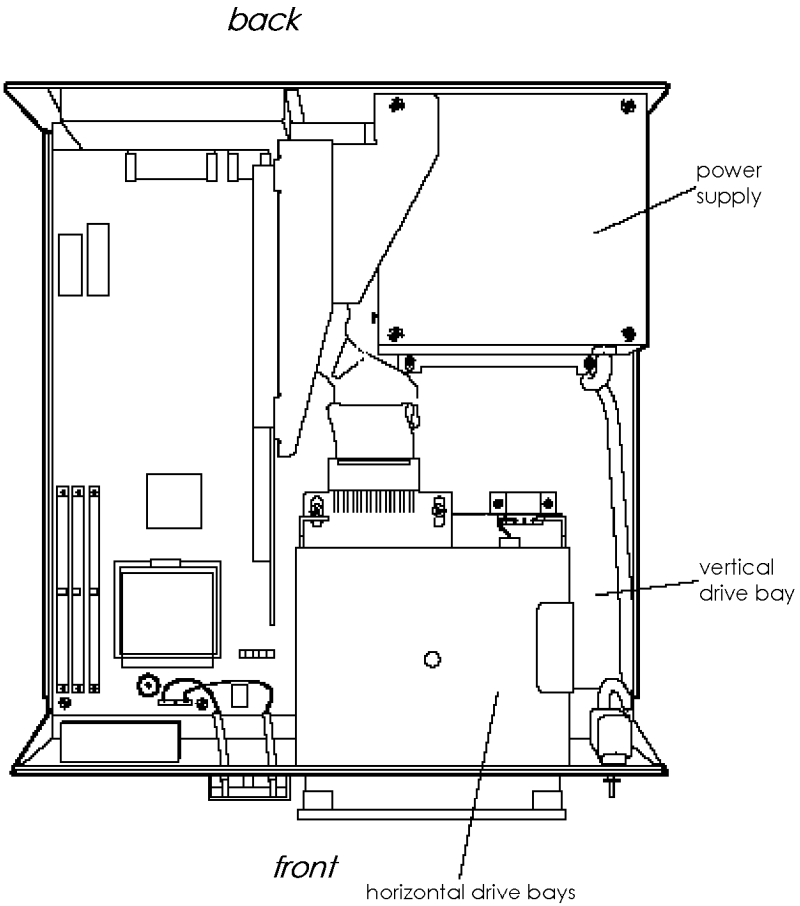
The instructions in this chapter describe how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including diskette drives, hard disk drives, a CD-ROM drive, optical drive, or tape drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Some of the steps in this chapter may not apply for your drive; see the documentation that came with the drive for more information.

Your computer can hold up to three drives in two horizontal drive bays and one vertical drive bay.

The upper horizontal bay contains the diskette drive that came with your system. If your system came with only one diskette drive or a dual diskette drive, you can install an additional device in the lower horizontal drive bay.

Use the following illustration to help you locate the drive bays on your system.



You can remove the hard disk drive already installed in the vertical drive bay and install a new one. You can also install an additional hard drive in the lower horizontal bay.

It is best to install your computer's first hard disk drive in the vertical drive bay. If you add a second hard disk drive or diskette drive, use the lower horizontal bay.

How to Use This Chapter

To install or remove a drive, first remove the computer's cover as described on page 4-4. Then see the table below for instructions you should follow next in this chapter.

To	See
Install a hard disk drive	"Setting the Hard Disk Drive Jumpers" on page 5-4
Install a diskette drive or other device in a horizontal drive bay	Page 5-16
Remove a diskette drive or other device from a horizontal drive bay	Page 5-27
Remove a hard disk drive from the vertical bay	Page 5-14

After you install or remove your drive(s), replace the computer's cover as described on page 4-23. Then see "Post-installation Procedures" on page 5-33 for additional steps you may need to perform.

Setting the Hard Disk Drive Jumpers

Most hard disk drives have jumpers that must be set for the drive to work properly with the computer. The jumpers tell the computer whether you are using one hard disk drive or two. If you purchased your computer with a hard disk drive already installed, these jumpers have been set correctly for your system.

If you install a second hard disk drive, you must set the jumpers on both drives to indicate which drive is the *master* (primary) drive and which is the *slave* (secondary) drive. A master drive is the drive on which you'll install the operating system that the computer loads into its memory each time you turn it on. You can run application programs and store data on both the master and slave drive, but the operating system must be on the master drive.

If you install a hard disk drive in your computer, be sure to check the drive's jumper settings before you install it. See the documentation that came with your drive to set the jumpers, then follow the instructions in this chapter to install the drive.

Where to Go Next

To install a hard disk drive in the vertical drive bay, see the next section. To install a hard disk drive in the lower horizontal drive bay, see "Installing a Drive in a Horizontal Bay" on page 5-16.

Installing a Hard Disk in the Vertical Bay

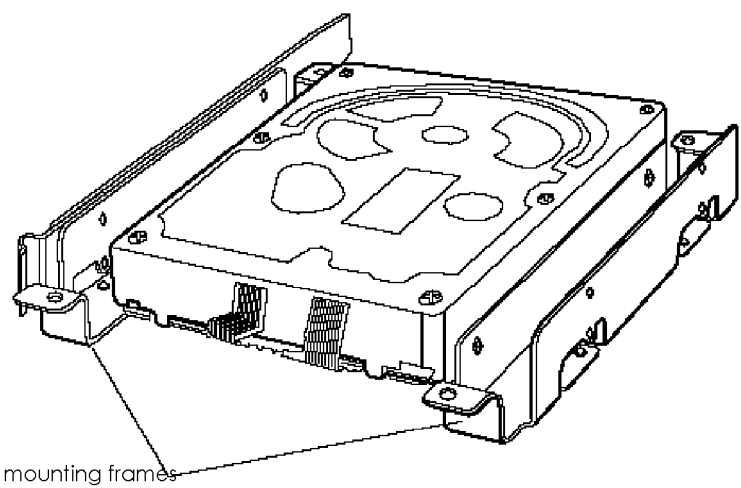
You should install your computer's first hard disk drive in the vertical drive bay. This section describes:

- ☐ Removing the mounting frames from the hard disk drive (if necessary)
- ☐ Installing the hard disk drive in the vertical drive bay
- ☐ Connecting the cables

Before you install a hard disk drive, be sure to check the jumpers on the drive. For instructions, see page 5-4.

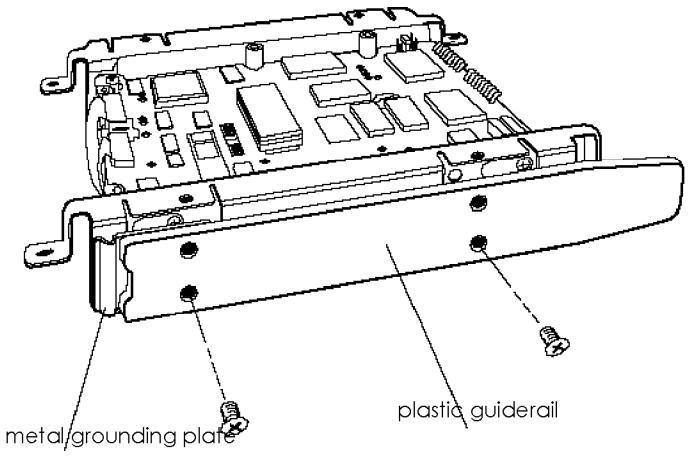
Removing the Mounting Frames

Your hard disk drive may have mounting frames attached to it, as shown below. You need to remove these frames before you can install the drive in the vertical bay.

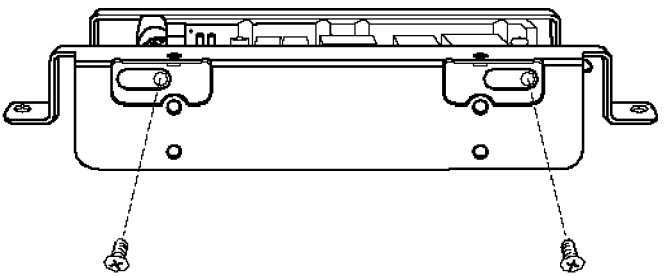


Follow these steps to remove the mounting frames:

1. On your hard disk drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame, as shown below, and remove the guiderail and grounding plate.



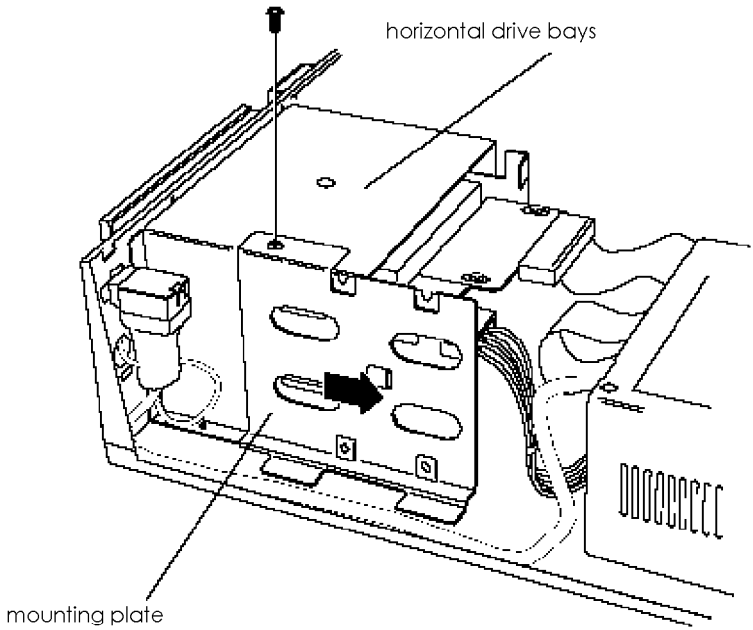
2. Then remove the two screws securing each mounting frame to the drive and remove the frames, as shown below.



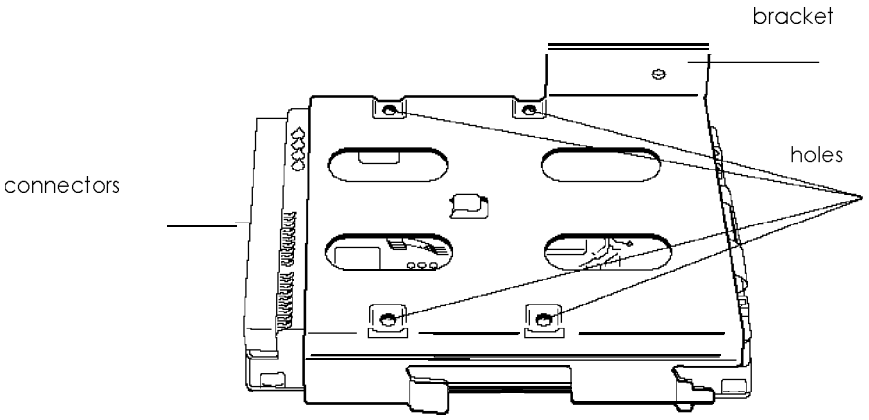
Installing the *Hard Disk*

To install the hard disk drive, you first need to attach it to the mounting plate in the vertical drive bay. Follow these steps:

1. Remove the screw securing the mounting plate to the horizontal drive bays and set it aside. Then slide the mounting plate in the direction of the arrow, and lift it out.



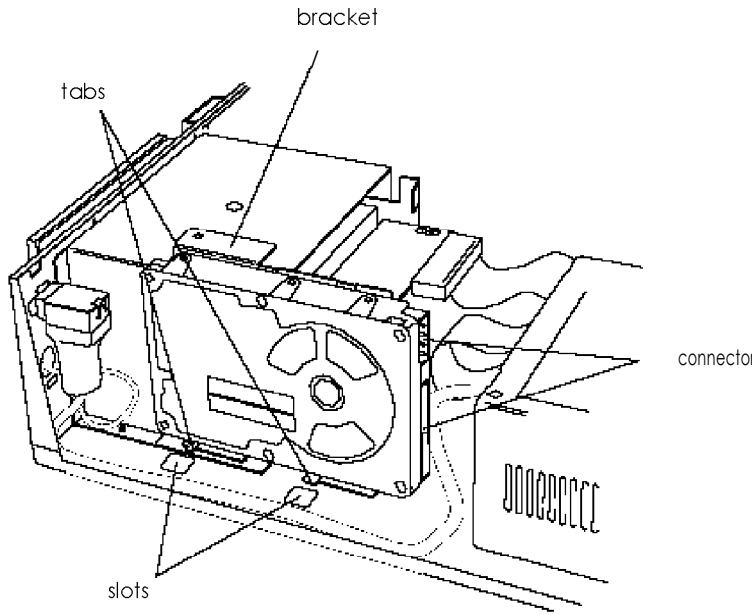
2. Turn the hard disk drive so the components face up and the connectors face left. Then place the mounting plate on the hard disk drive and align the four holes in the plate with the four holes in the drive, as shown below.



The bracket on the mounting plate should be on the opposite side of the connector end of the drive.

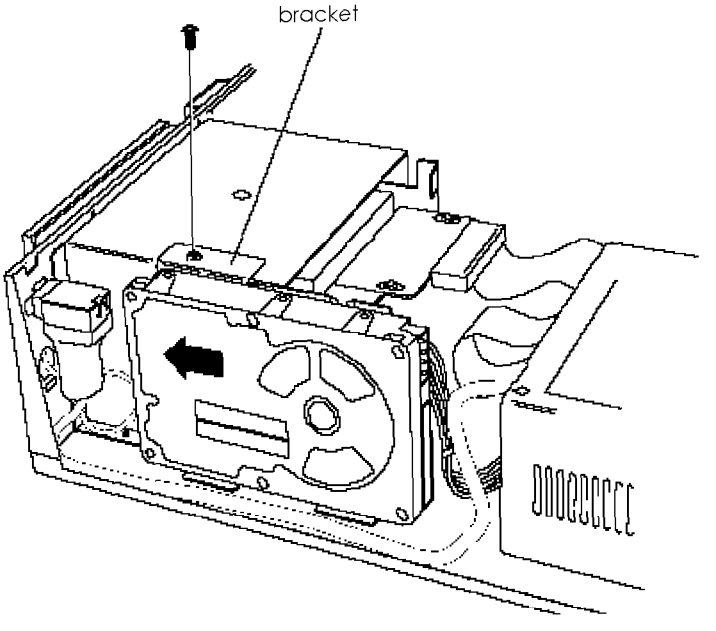
3. Use the screws that came with the hard disk drive (or with your computer) to secure the mounting plate to the drive.

4. Hold the drive so the mounting plate faces the horizontal drive bays (with the bracket over the top) and the connectors face the back of the computer, as shown below.



The two tabs at the bottom of the mounting plate should be just above the two slots in the computer case.

5. Lower the tabs into the corresponding slots in the computer case. Slide the drive in the direction of the arrow, until the hole in the bracket is aligned with the hole on top of the horizontal drive bays.



6. Secure the mounting plate with the screw, as shown above.

Connecting the Cables

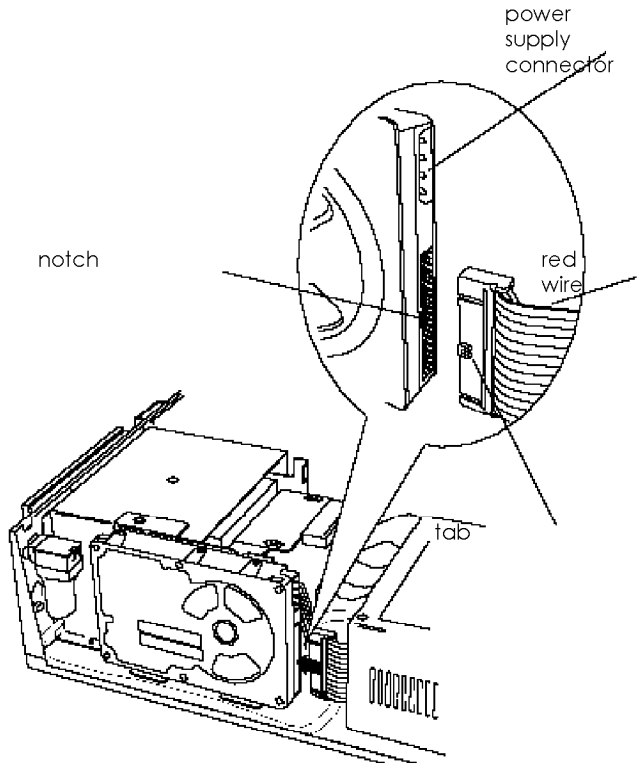
To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable. Follow these steps:

1. If you are installing your computer's first hard disk drive, you need to connect the hard disk drive ribbon cable to the system board now. Follow the instructions on page 5-31 and then return here.

2. The hard disk drive ribbon cable should be connected to the main system board. Locate the free connector on the end of this cable. (If there is a hard disk drive in the lower horizontal bay, the middle connector is attached to that drive.)

3. Notice the small tab in the middle of the cable connector; align this tab with the notch in the hard disk drive connector, as shown in the following illustration.

> *Note*
> When the hard disk drive ribbon cable is positioned correctly, the red wire on the cable aligns with pin 1 on the drive connector. To identify pin 1, look for a 1 or 2 at the connector on the drive's circuit board.

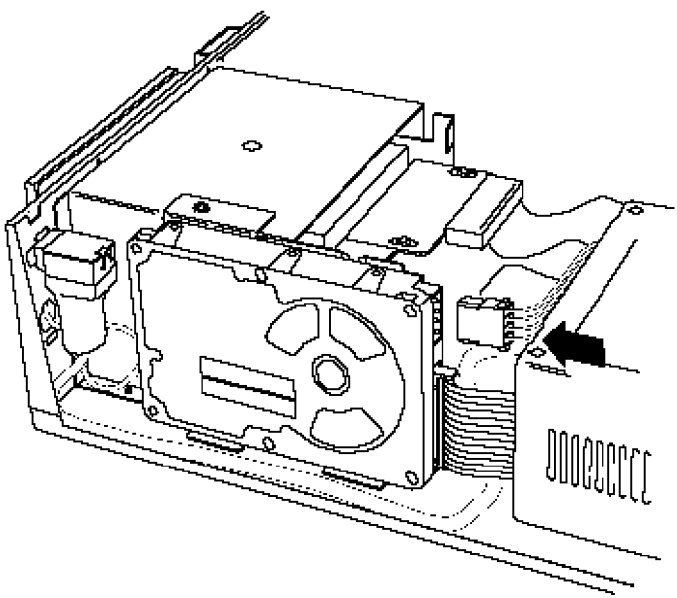


4. Make sure the holes in the cable connector fit over all the pins in the hard disk drive connector; then push in the connector.

> **Caution**
> If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

5. Locate one of the power supply cables that lead from the power supply (behind the horizontal drive bays). The power supply cables may be secured in a plastic band on the side of the power supply. If so, unfasten the band to access the cables; you can use any one that is free. (If your drive requires a small power supply cable connector, use the small connector.)

6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive. Make sure the holes fit over all the pins and then push in the connector firmly

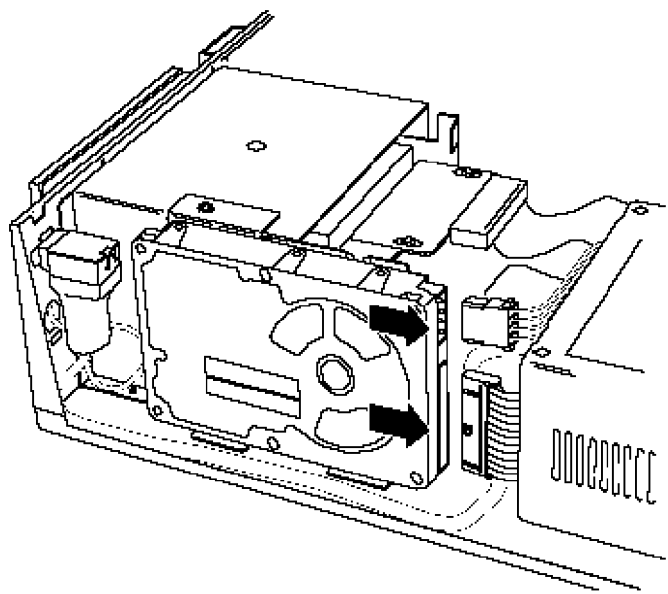


Caution
If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

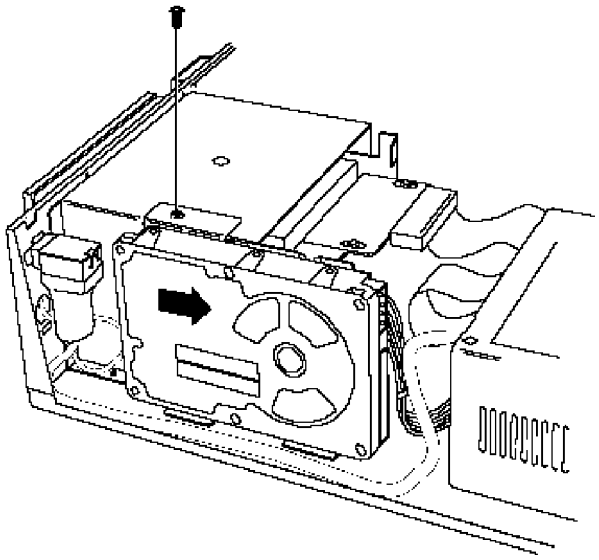
Removing a Hard Disk From the Vertical Bay

Follow these steps to remove a hard disk drive from the vertical drive bay:

1. Disconnect the hard disk drive ribbon cable and power supply cable from the back of the drive, as shown below. Grasp the cable connectors and pull them straight out from the connectors on the hard disk drive so you do not bend the pins; do not pull on the cables.



2. Remove the retaining screw securing the hard disk drive and mounting plate to the horizontal drive bays. Then slide the hard disk drive and mounting plate in the direction of the arrow, as shown in the following illustration, and lift them out.



3. Remove the screws securing the mounting plate to the hard disk drive. You can store the mounting plate and its screw or replace it in the computer and secure it with the screw.

4. Wrap the hard disk drive in its original packing materials and store it along with the screws.

5. If you removed your computer's only hard disk drive, disconnect the hard disk drive ribbon cable from the main system board and store it as well.

If you removed one hard disk drive and are leaving another one in the computer, you need to set the jumpers on the remaining drive to indicate that you now have only one hard disk drive. For the correct settings, see the documentation that came with the drive.

Installing a Drive in a Horizontal Bay

This section describes how to install a drive in a horizontal bay. Although the illustrations show a diskette or hard disk drive in the lower bay, you can use these instructions to install a drive in the upper bay. You'll find steps for the following procedures:

- ☐ Attaching the mounting frames to a hard disk drive (if necessary)
- ☐ Installing the drive
- ☐ Connecting the cables.

If you are installing your computer's first hard disk drive, it is best to use the vertical drive bay as described on page 5-5.

> *Note*
> Before you install a hard disk drive, be sure to check the jumpers on the drive. For instructions, see page 5-4.

Depending on the type of drive you are installing, you may need to attach mounting frames to it before you install it in a horizontal bay. Follow these guidelines:

- ☐ If you are installing a diskette drive, skip to "Installing the Drive" on page 5-18.

- ☐ If you install a hard disk drive that has a 3.5-inch form factor, it must have mounting frames to fit properly in the horizontal bay. Follow the steps in the next section.

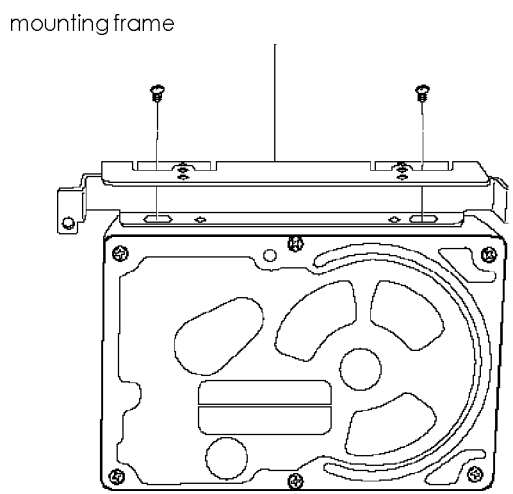
- ☐ If you are installing a hard disk drive that already has mounting frames on it, see if it also has a plastic guiderail and metal grounding plate attached to it. If so, follow step 1 on page 5-6 to remove the guiderail and grounding plate. Then go to "Installing the Drive" on page 5-18.

*Attaching **Mounting** Frames **to** a Hard Disk*

To attach mounting frames to a hard disk drive, follow these steps:

1. Locate the two mounting frames and the screws that came with the drive.

2. As shown below, place a mounting frame on one side of the drive and align it so that the holes in the drive are approximately in the middle of the oval holes in the frame. Then secure the mounting frame to the drive with the two screws.



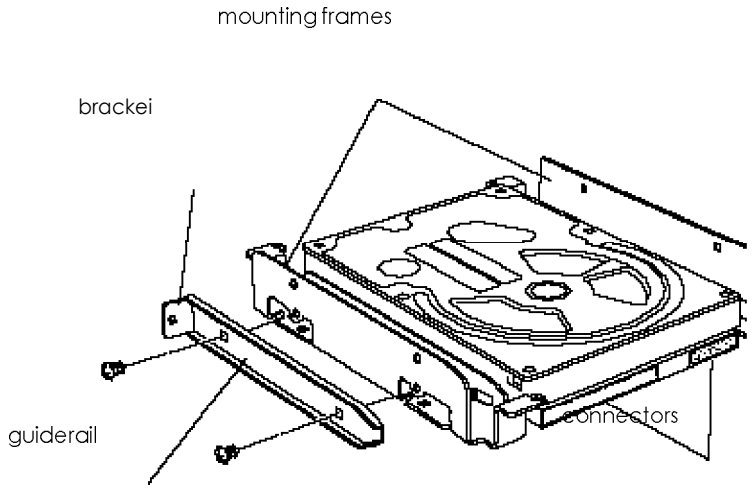
3. Repeat step 2 to attach a mounting frame to the other side of the drive.

Installing the Drive

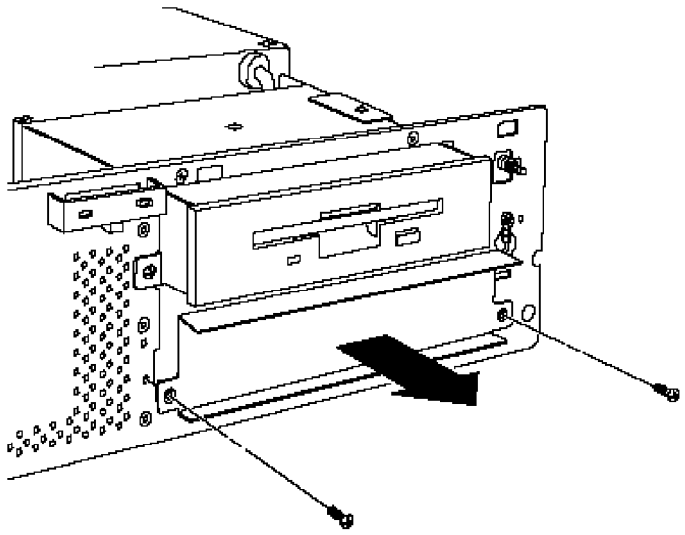
Follow these steps to install the drive in a horizontal drive bay:

1. Locate the two metal guiderails and screws that came with the computer.

2. Using the appropriate screw holes, attach one guiderail to each side of the drive (or each mounting frame, if attached), as shown below. The bracket on the guiderail should be near the end of the drive opposite the connector.



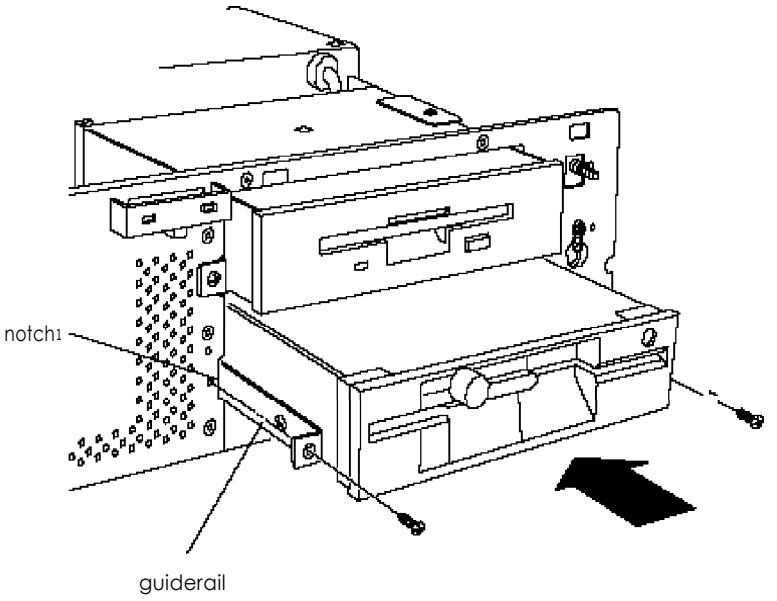
3. If you are installing a drive in the lower bay, remove the two retaining screws securing the metal cover to the front of the computer and remove the cover. Store it in a safe place and save the screws to use later in these steps.



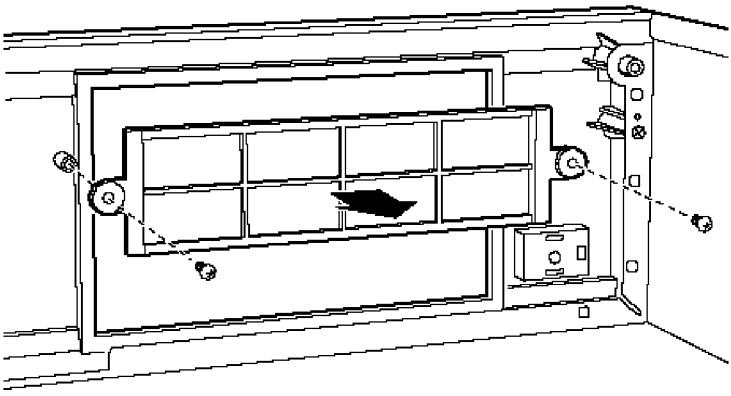
4. If you are installing a 5.25-inch diskette drive, hold it so that the diskette release latch is above the diskette slot. If you are installing a 3.5-inch diskette drive or a 5.25-inch/ 3.5-inch dual drive, hold it so that the diskette release button(s) are on the right and the drive light is on the left.

   If you are installing a hard disk drive, hold it so that the component side faces down, and skip to step 7.

5. To insert a diskette drive, align the guiderails on each side of the drive with the notches on each side of the drive bay and slide the drive into the bay as far as it will go, as shown below. Secure the guiderails to the computer case with the two retaining screws.

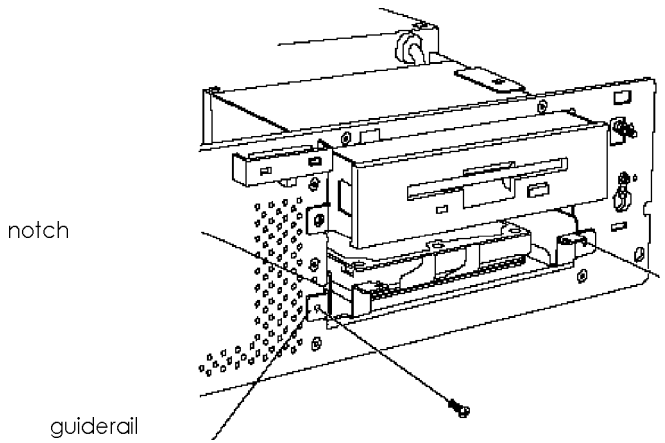


6. If you are installing a diskette drive in the lower bay, you need to remove the faceplate on the computer's front panel because it covers this bay. Turn the computer cover upside down and locate the faceplate. Remove the screws securing the faceplate to the inside of the cover and remove the faceplate, as shown in the following illustration.



Store the faceplate and screws in a safe place; you may want to install it again later. Then go to "Connecting the Cables" on page 5-22.

7. To insert a hard disk drive, align the guiderails on each side of the drive with the notches on each side of the drive bay and slide the drive all the way into the bay, as shown below. Secure the guiderails to the computer case with the two retaining screws.



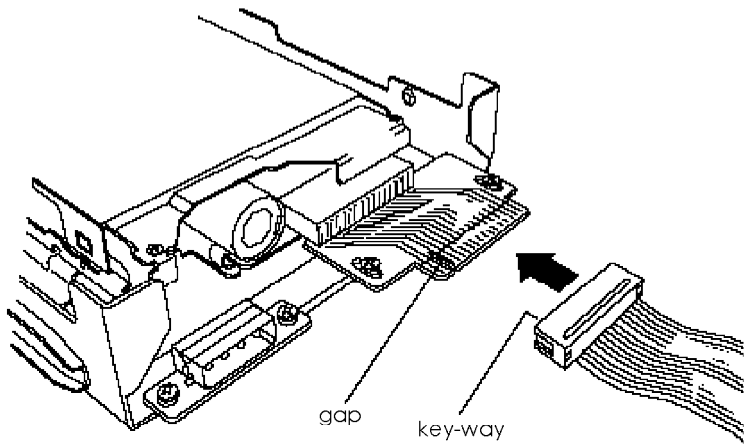
Connecting the Cables

To connect the drive to the computer, you need to connect two cables: a drive ribbon cable and a power supply cable. The steps below describe how to connect these cables to the drive.

If you are installing a diskette drive, follow step 1 and then skip to step 3. If you are installing a hard disk drive, start with step 2.

1. Locate the diskette drive ribbon cable. One end of the cable is connected to the system board. If you are installing a second diskette drive in the lower horizontal drive bay, the other end of the cable is connected to the top diskette drive; use the middle connector. If you are installing a diskette drive in the upper bay, use the free end connector.

The diskette drive connector that extends from the back of the drive has gold contacts on both sides. Grasp the cable connector and align it with the drive connector so that the key-way (the plastic divider) in the cable connector lines up with the gap in the drive connector, as shown below.

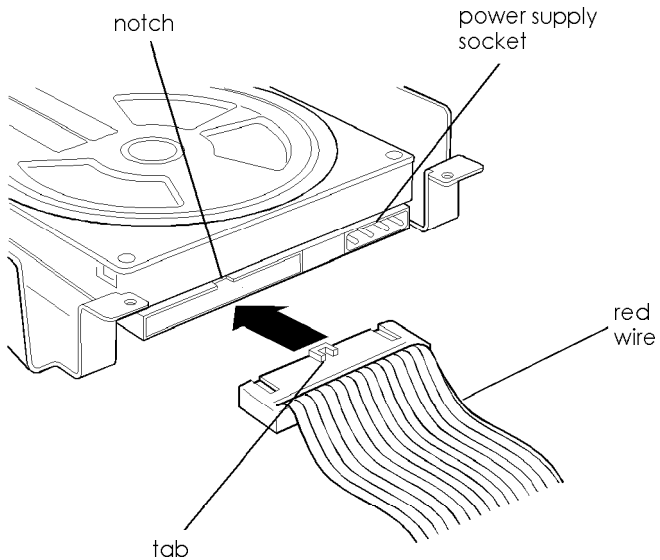


Make sure the cable connector fits properly onto the drive connector and push it into place. Be careful to align the connector correctly; otherwise, you could severely damage your drive when you push it in. Go to step 3.

2. Locate the hard disk drive ribbon cable. If you are installing a second hard disk drive, one end of the cable is connected to the system board and the other end is connected to the first hard disk drive in the vertical drive bay; use the free middle cable connector to connect the second hard disk drive as described below.

If you are installing your computer's first hard disk drive, you need to connect the hard disk drive ribbon cable to the system board now. Follow the instructions on page 5-31 and then use the middle cable connector to connect the hard disk drive as described below.

Notice the small tab in the middle of the cable connector; align this tab with the notch in the hard disk drive connector, as shown below.



When the hard disk drive ribbon cable is positioned correctly, the red wire on the cable is aligned with pin 1 on the drive connector. To identify pin 1, look for a 1 or 2 near the connector on the drive's circuit board.

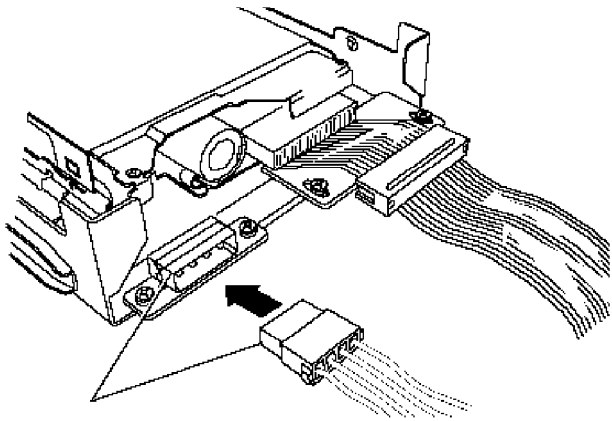
Make sure the holes in the cable connector fit over all the pins in the hard disk drive connector; then push in the cable connector.

> **Caution**
> If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

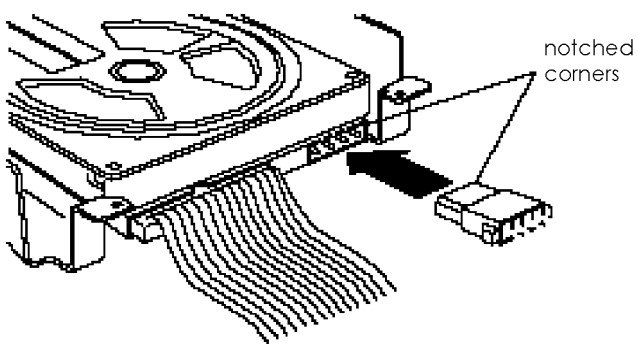
3. Locate one of the power supply cables that lead from the power supply (behind the horizontal drive bays). The power supply cables may be secured in a plastic band on the side of the power supply. If so, unfasten the band to access the cables; you can use any one that is free. (If your drive requires a small power supply connector, use the smaller one.)

4. Position the power supply cable connector so that its notched corners line up with the notched corners of the drive's power supply connector, as shown below. Make sure the holes fit over all the pins and then push in the connector.

***diskette** drive*



hard disk drive



Caution
If you do not align the cable connector correctly, you could severely damage your drive when you push it in.

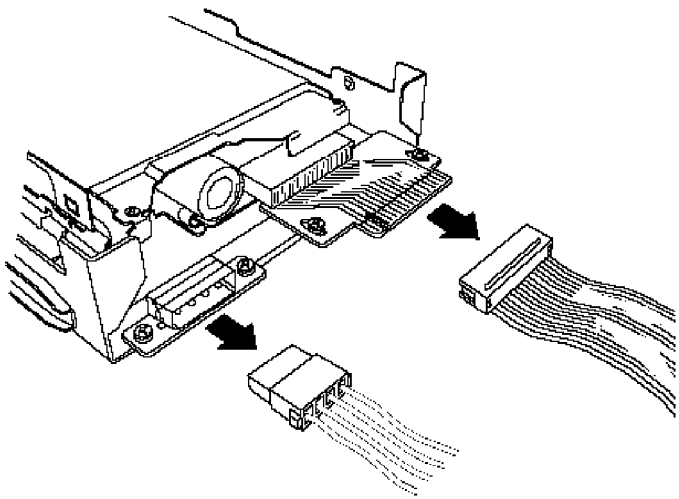
Removing a Drive From a Horizontal Bay

This section describes how to remove a drive from a horizontal drive bay. Although the illustrations show a diskette or hard disk drive in the lower bay, you can use these same instructions to remove the diskette drive from the upper bay.

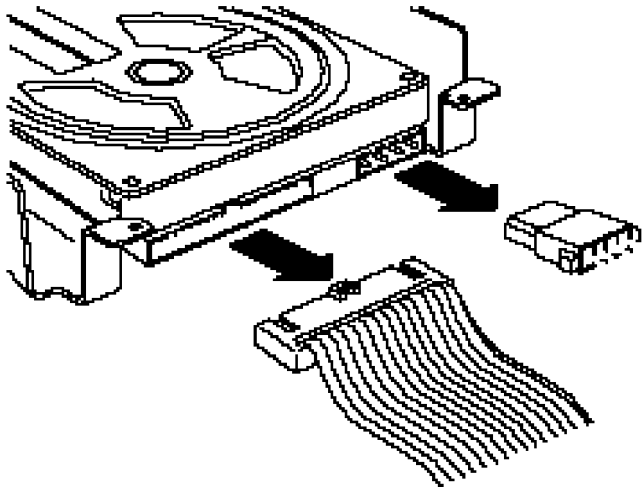
Follow these steps to remove a drive from a horizontal bay:

1. Disconnect the drive ribbon cable and power supply cable from the back of the drive, as shown below. Grasp the cable connectors and pull them straight out from the connectors on the drive so you do not bend the pins; do not pull on the cables.

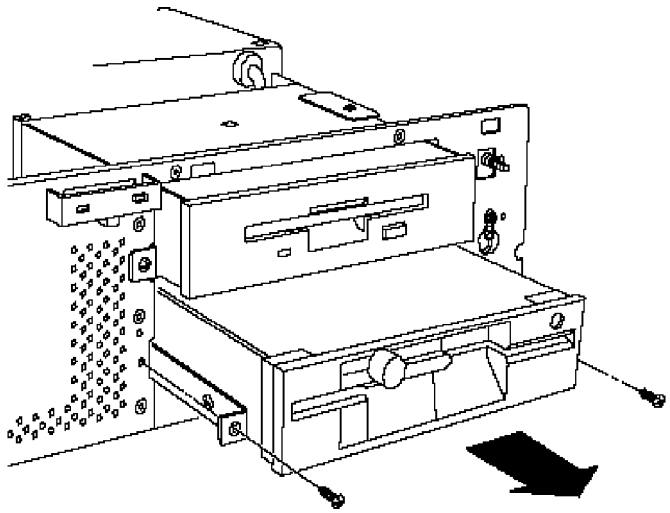
***diskette** drive*



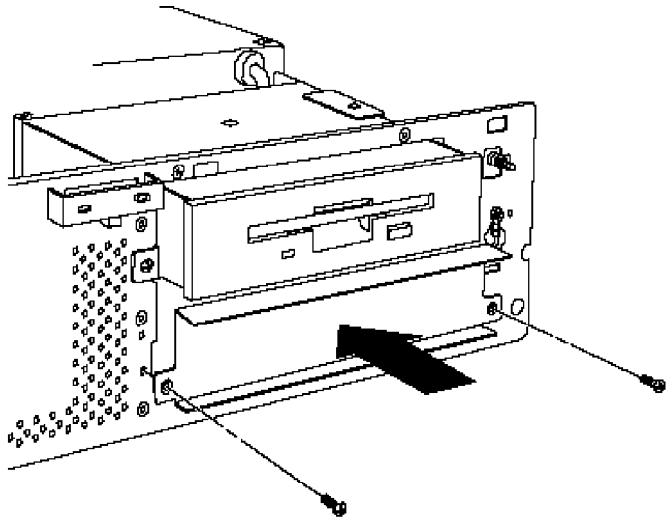
hard disk drive



2. Remove the two retaining screws securing the drive to the drive bay. Then grasp the front of the drive and pull it completely out of the bay.



3. If you are leaving the drive bay empty, replace the metal cover and two retaining screws, as shown below.



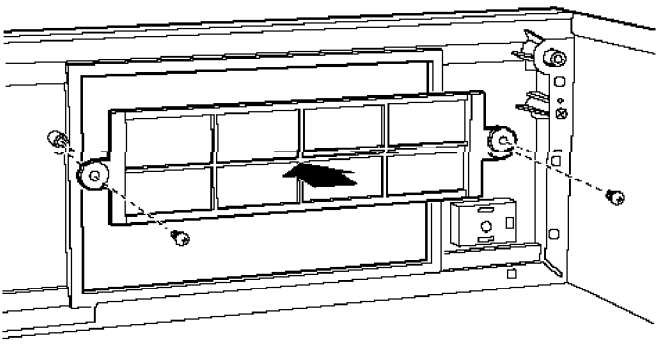
4. If you are replacing the drive you removed with another drive, remove the guiderails and screws from the drive and use them to install the other drive as described in "Installing a Drive in a Horizontal Bay" on page 5-16.

5. Wrap the drive in its original packing materials and store it in a safe place.

6. If you removed your computer's only hard disk drive, disconnect the hard disk drive ribbon cable from the system board and store it as well.

   If you removed one hard disk drive and are leaving another one in the computer, you need to set the jumpers on the remaining drive to indicate that you now have only one hard disk drive. See the documentation that came with the drive for the correct jumper settings.

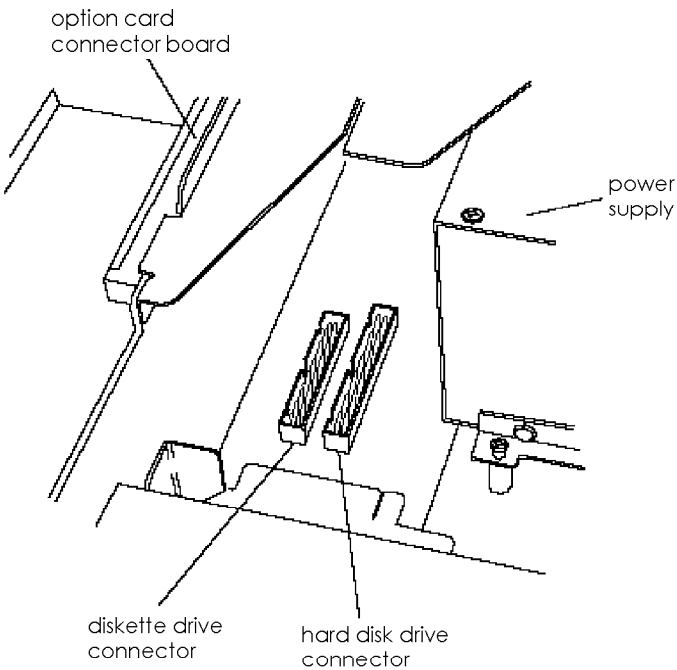
7. If you removed a diskette drive from the lower bay and you are leaving the bay empty or installing a hard disk drive in it, you need to replace the front panel faceplate on the computer's cover. Secure the faceplate to the inside of the computer's cover with the two screws, as shown below.



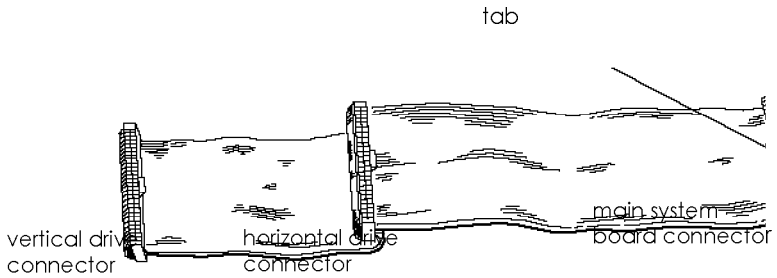
Connecting the Hard Disk Drive Ribbon Cable to the System Board

Follow these steps to connect the hard disk drive ribbon cable to the system board:

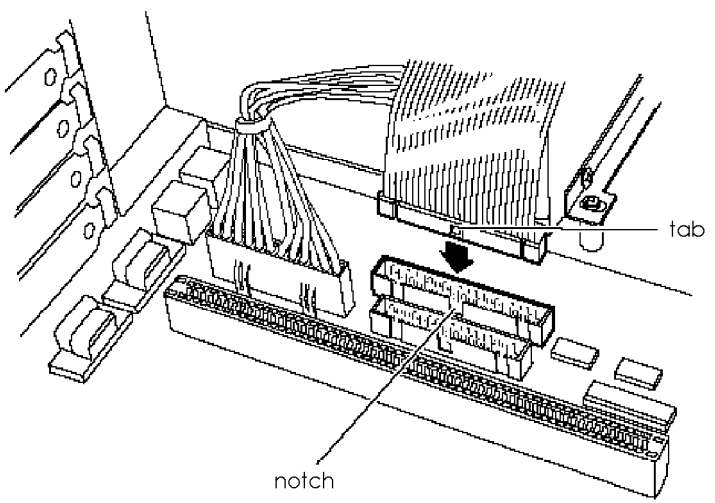
1. Locate the hard disk drive connector on the system board. As shown below, it is next to the diskette drive connector, between the option card connector board and the power supply. (The diskette drive ribbon cable is removed from the illustration for clarity.)



2. Locate the hard disk drive ribbon cable that came with the computer. It is a flat cable with three connectors: one on each end and one in the middle, as shown below.



3. Select the connector on the end of the longest part of the cable (the main system board connector). Notice the small tab in the middle of the cable connector, as shown in the illustration above. Position the connector so that the tab aligns with the notch, as shown below. (The option card connector board and diskette drive ribbon cable are removed from the illustration for clarity.)



4. Make sure the holes in the cable connector fit over all the pins in the system board connector; then push in the cable connector.

> **Caution**
> If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Post-installation Procedures

After you install or remove your drive(s) and replace the computer's cover, follow the steps below to make sure your new configuration works properly:

1. Run the SETUP program to configure your computer for your new set of drives. See Chapter 2 for instructions.

2. If you installed a non-IDE hard disk drive (which requires a separate controller card to control it), you need to run the SETUP program to disable the built-in IDE hard disk drive interface.

3. You may need to format the drive before you can use it. (All EPSON-supplied drives are sold already formatted.) Check the manual that came with the drive to see if it is already formatted. If not, follow the manufacturer's instructions to format the drive.

   You also need to format the drive for the operating system you are using. See your operating system manual for instructions.

4. If you want to be able to load your operating system from a new hard disk drive, you need to install it on the drive. See the documentation that came with your operating system for instructions.

Chapter- 6
Troubleshooting

Refer to this chapter if you encounter any difficulties as you set up and use your computer. If the suggestions here do not solve the problem, perform the steps below to identify your system and note any error messages your computer displays. Then contact your sales representative or the EPSON Connection at (800) 922-4911 for assistance.

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use these guidelines to locate information about your system:

Serial number:	Look on the back panel of the computer to find the serial number.
System BIOS version:	Restart your system. You'll see the system BIOS version number displayed on the screen when your system performs power-on diagnostics.
System configuration:	Start SETUP and select the System Summary option to see your system's configuration.

MS-DOS version:	At the MS-DOS prompt, type VER and press Enter to see the MS-DOS version number.
Software versions:	In Windows applications, select "About" from the Help menu. As your software application starts, it usually displays a version number on the banner screen. Also, you can check your application documentation for a version number.
CONFIG.SYS:	At the MS-DOS prompt, type **TYPE** CONFIG. SYS and press Enter to see a listing of your CONFIG.SYS file. This file contains your system configuration information.
AUTOEXEC.BAT:	At the MS-DOS prompt, type **TYPE** AUTOEXEC.BAT and press Enter to see a listing of your AUTOEXEC.BAT file. This file contains your system startup information.

Error Messages

Your computer's built-in memory (ROM) contains a series of diagnostics programs, called power-on diagnostics, which your computer runs automatically every time you turn it on. These programs check internal devices such as ROM, RAM, the timer, the keyboard controller, and the hard disk drive.

When the system detects an error that isn't serious, such as an incorrectly defined diskette drive, you see an error message and the following prompt:

```
Press <F1> to run SETUP or RESUME
```

Write down the error message.

If the computer detects a serious error, it cancels further checking and halts system initialization. The error message remains on the screen and the computer locks up. If this happens, see "The Computer Won't Start" in this chapter. If none of the suggestions listed there solves the problem, contact your sales representative or the EPSON Connection as soon as possible. Report any error messages when you request technical assistance.

The following table lists error messages that may appear during power-on diagnostics. If you receive an error message, look it up in the table below; it directs you to the proper troubleshooting section in this chapter or offers a solution. If you do not see an error message, read the section that covers your problem.

Power-on diagnostics error messages

Error message	Action
CMOS BATTERY HAS FAILED	The CMOS battery is bad. Contact your sales representative or the EPSON Connection.
CMOS CHECKSUM ERROR - DEFAULTS LOADED	Your CMOS RAM has possibly been corrupted. Run the SETUP program and check your settings (see Chapter 2). If your settings are correct, save them as you exit the SETUP program. If you see the message again, or if your settings returned to the factory defaults, contact your sales representative or the EPSON Connection.

Power-on diagnostics error messages (continued)

Error message	Action
DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER	The system found no boot device. First run the SETUP program and check the boot sequence settings. If the settings are correct and you are booting from a hard disk drive, see "Hard Disk Problems." If you are booting from a diskette, make sure the diskette is bootable; then see "Diskette Problems."
DISPLAY SWITCH IS SET INCORRECTLY	DIP switch 4 conflicts with the video options in the SETUP program. See Chapter 4 for correct DIP switch settings and Chapter 2 for instructions on running SETUP.
DISPLAY TYPE HAS CHANGED SINCE LAST BOOT	The display adapter has been changed. Run SETUP. See Chapter 2.
FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT	The system was unable to detect a diskette drive controller. If you have no diskette drive, run SETUP and select **none** for both diskette drives. If you have at least one diskette drive, see "Diskette Drive Problems."
FLOPPY DISK TYPE IS SET INCORRECTLY OR DRIVE ERROR	The installed diskette drive does not match the CMOS definition. See "Diskette Drive Problems."
HARD DRIVE CONTROLLER DIAGNOSTICS ERROR	The system was unable to detect the hard disk drive controller. See "Hard Disk Problems."
HARD DRIVE SECTOR VERIFY ERROR	Your hard disk drive may be damaged. Contact the EPSON Connection.
KEYBOARD ERROR OR NO KEYBOARD PRESENT	Your keyboard may not be connected correctly. See "Keyboard Problems."

Power-on diagnostics error messages (continued)

Error message	Action
MEMORY ERROR DURING MEMORY TEST	Your SIMMs may not be installed correctly. See "Memory Module Problems."
NON-SYSTEM DISK OR DISK ERROR	The system cannot boot from the diskette. Make sure the diskette is bootable and see "Diskette Problems."
PASSWORD CHECK FAILED - SYSTEM HALTED	You've entered an incorrect password. See "Password Problems."
UNABLE TO INITIALIZE HARD DRIVE (DRIVE TYPE?)	Your hard disk drive cannot be initialized. See "Hard Disk Problems."
UNABLE TO RECALIBRATE HARD DRIVE	Your drive is probably damaged. Contact the EPSON Connection.
UNABLE TO RESET HARD DRIVE/ CONTROLLER ERROR	Your system cannot find or initialize your hard disk drive controller. See "Hard Disk Problems."

The Computer Won't Start

If your computer does not start when you turn on the power, check the following:

1. Is the power light on? If not, remove any diskettes and turn off the power. Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet. Replace your main operating system diskette, if necessary, and turn on the computer again.

> **Caution**
> If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

2. If the power light still does not come on, check the electrical outlet for power. Turn off your computer, unplug the power cord, and plug a lamp into the outlet. Turn it on to see if the outlet supplies power.

3. If you installed or removed any of your system components, such as a disk drive, check to make sure you have reconnected all the internal and external cables correctly. See Chapters 4 and 5 for instructions.

   You may have installed option cards that exceed the system's power requirements. Check the power requirements in Appendix A.

4. If the electrical outlet is working and all the connections are secure but your computer still won't start, call your sales representative or the EPSON Connection for assistance.

The Computer Does Not Respond

If your computer locks up and does not respond when you type on the keyboard, follow these steps:

1. Wait a few moments; some operations take longer than others to complete. For example, the computer takes longer to sort a database than to display the time. If your computer still does not respond after a reasonable length of time, proceed to the next step.

2. If you have just made a change in your system configuration, your computer may take a few minutes to complete its power-on diagnostics. The first time you turn on your computer after making such a change, it can take several minutes to finish its self test, depending on what you changed. If the computer does not display the operating system prompt after five minutes, turn it off, wait 20 seconds, and try again. If that doesn't work, turn off the computer, insert your main operating system diskette in drive A and turn on the computer. If it still does not boot, contact your sales representative or the EPSON Connection for assistance.

3. Did you enter the correct password? See "Password Problems" below.

4. Could your software be causing the problem? If you are running an application program, see "Software Problems" later in this chapter.

5. The problem could be caused by your keyboard. See "Keyboard Problems" later in this chapter.

6. If you want to stop whatever the computer is doing and return to the MS-DOS command prompt, hold down the **Ctrl** key and press **Break** (or **C**). See Chapter 3 for more information on stopping a command or program.

7. If your computer still does not respond, you can reset it using the **Ctrl Alt Delete** command. See "Resetting Your Computer" in Chapter 3 for more information.

8. If resetting the computer does not work, turn it off and wait at least 20 seconds. If you do not have a hard disk drive, insert your main operating system diskette in drive A; then turn on the computer. It should load the operating system.

***Restoring the** Power Supply*

To restore normal power supply operation, follow these steps:

1. Turn off the computer and leave it off for at least 30 seconds to reset the power supply logic.

2. To determine the cause of the high temperature and correct the condition, check for the following:

   - ☐ Room temperature above 90" F (32° C). If this is the case, relocate the computer to a cooler area.

   - ☐ A blocked power supply fan. Make sure there is space around the power supply fan vents in the back and sides of the computer case. Remove the computer's cover and check both inside and outside the computer for blockage. Make sure there is ample room around your system for air circulation.

   - ☐ An overload of the power supply limitations. Check the table in Appendix A to see if you have exceeded the option slot power limits. See your option card manual(s) for the power requirements for your option card(s).

3. After you correct the problem causing the overheating, allow the computer to cool down for at least five minutes at room temperature (about 78 F or 25 C).

4. If you removed the computer's cover, replace it now. (See Chapter 4 for instructions.) Then turn on the computer.

If the power supply shuts off again, contact your sales representative or the EPSON Connection for assistance.

Password Problems

If you have any trouble using your password, try the following:

1. If you think you know the correct password, reset the computer and try again. See Chapter 3 for instructions
2. If you know the current password but you want to change or delete it, see Chapter 2 for instructions.
3. If you do not know the current password and you cannot access your computer or use the SETUP program, see the next section.

Accessing Your System

If you have forgotten your current password, follow these steps:

1. Turn off the computer.
2. Disable the password function by setting DIP switch 4 to On. (See Chapter 4 for instructions.)
3. Turn on the computer.
4. Turn the computer off again.
5. Follow the instructions under "Changing the DIP Switch Settings" in Chapter 4 to set DIP switch 4 to the Off position.

6. Turn on the computer again

7. When you see **Press <Del> If you want to run SETUP**, press Delete. You see the SETUP main menu. Press ↓ to highlight option 3, Set **Password options**; then press Enter. If you do not want to set a new password, go to step 9. If you want to set a new password, go to step 8.

8. To set a new password, set the **Password State** option to **Installed** and press Enter. Type a new password at the prompt and press Enter. You must enter it twice. (See Chapter 2 for more information.) Now go to step 10.

9. To disable the password, press PgUp or PgDn until the **Password State** option is set to **Not Installed**; then press Enter. (See Chapter 2 for more information.)

10. Save your settings as you exit SETUP. The computer reboots. If you disabled password security, you do not see the password prompt and can access your computer immediately. If you set a new password, you see the password prompt.

Keyboard Problems

If you have trouble with the keyboard, check the following:

1. If the screen displays a keyboard error message when you turn on or reset the computer, make sure the keyboard is securely connected to the correct port. See "Connecting the Keyboard" in Chapter 1 for instructions.

2. If nothing happens when you type on the keyboard, see "The Computer Does Not Respond," above.

3. If the cursor keys on the numeric keypad do not work properly, the Num Lock function may be on. When Num Lock is on, the keys on the numeric keypad work only as numbers. If the Num Lock light in the upper right corner of the keyboard is lit, press **Num Lock** to turn off the function

   If you want to change the initial Num Lock setting, see "Setting the Keyboard Options" in Chapter 2.

4. If you still have trouble with the keyboard, contact your sales representative or the EPSON Connection for assistance.

Monitor Problems

For monitor problems, check the following:

1. If there is no display on the screen, check that the monitor's power switch is on and that its power light is lit. If the power light is on but you still do not see anything on the screen, check the brightness and contrast controls.

2. If the power switch is on but the power light is not, turn off the monitor's power, wait five seconds, and turn it back on. Wait to see if the screen displays any text.

3. If the screen is still blank, make sure the monitor is connected to the computer securely. See "Connecting a Monitor" in Chapter 1 for instructions.

4. If the monitor's power light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on to see if the outlet supplies power.

5. If you installed a display adapter card, make sure your monitor and display adapter match. Also check to see if the card's switches or jumpers are set properly, and if the card is properly seated in the slot. See "Installing an Option Card" in Chapter 4 and your monitor and display adapter card manuals for instructions.

6. If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

7. If you still have difficulty with your monitor, contact the representative who sold you the monitor.

Diskette Problems

If you see an error message or have trouble accessing data on a diskette, try the following steps:

1. You may have inserted the diskette upside-down or it may not be inserted all the way. Remove the diskette and reinsert it. If the diskette drive has a latch, be sure to turn it down to secure the diskette. See Chapter 3 for detailed instructions on inserting and removing diskettes.

2. If reinserting the diskette does not solve the problem and you have access to another drive of the same type, place the diskette in the other drive and repeat the operation. If you can read the diskette, the trouble may be in your diskette drive. See "Diskette Drive Problems" below.

3. Have you inserted the right type of diskette? For example, are you trying to read a 1.44MB diskette in a 720KB diskette drive?

4. Is the diskette write-protected? On a 3.5-inch diskette, the write-protect switch may be set to the write-protect position or there may be no switch. On a 5.25-inch diskette, there may be a write-protect tab over the side notch or there may be no notch. You cannot alter data on a write-protected diskette. (Some programs do not function properly if the diskette is write-protected.)

5. Is the diskette formatted? A new diskette must be formatted before you can store data on it. See your operating system documentation for instructions on formatting diskettes.

6. Did you receive one of the following MS-DOS error messages?

```
Disk Drive Error: Abort, Ignore, Retry?

Disk error reading drive a:

Disk error writing drive a:
```

   If you see one of these messages, make sure the diskette is properly inserted in the drive. If the problem persists, try removing the diskette and reinserting it. If the error message still occurs, you may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

7. If you see no error messages but there is something wrong with the data in a file, the operating system or an application program may have updated the storage information on the diskette incorrectly. This is probably the case if you have one of these problems:

   - ☐ Part of a file is missing
   - ☐ A file includes parts of other files
   - ☐ An expected output file is missing.

If you are using MS-DOS use CHKDSK to make the necessary repairs; see your MS-DOS documentation for instructions. You may also have some special diagnostic software you can use to check your diskettes.

Diskette Drive Problems

If you see a diskette error message or have difficulty with a diskette drive, follow these steps:

1. If you have problems with a new diskette drive that someone else installed, consult that person about the problem.

2. If you installed the drive yourself, did you carefully follow all the steps in Chapter 5? Review the instructions and check all the cable connections to make sure you installed the drive correctly.

3. Did you run the SETUP program and configure the correct type of diskette drive for your system? (See Chapter 2 for instructions.)

4. If the diskette drive is making loud or unusual noises, do not attempt any further examination of it. Contact the EPSON Connection for assistance.

Hard Disk Problems

If you have a problem with a hard disk, it could be the result of improper installation, incomplete disk preparation, or corrupted data. Consult one of the following sections:

- ☐ Installing the drive
- ☐ Preparing the drive for use

- ☐ Accessing data on the drive.

> **Caution**
> If your hard disk has data on it, always be sure to back up your data before reformatting or repartitioning the drive.

Installing the Drive

If you have problems with a newly installed drive, check the following:

1. If someone else installed the drive, consult that person about the problem.

2. If you installed the hard disk in your computer, did you carefully follow all the instructions in Chapter 5? Review the instructions, check all the cable connections, and check the jumper settings on your drive.

3. If you installed an IDE hard disk drive, be sure you run SETUP to update your configuration. Check to make sure you selected the correct drive type and that you enabled the on-board IDE hard disk drive controller with the **`Peripherals setup`** option in SETUP. If you connected the IDE drive to a controller on an option card, be sure you set the on-board IDE controller to **`Disabled`**. See Chapter 2 for instructions.

4. If you installed a non-IDE hard disk drive, was it physically formatted by the manufacturer? A blank, new hard disk must be physically formatted (or initialized) before you can partition it and install an operating system on it. This type of format is usually done by the manufacturer; if yours was not, you must do it yourself. If the drive came with its own format utility, use that program.

Note that a physical format is different from the software formatting commands (such as the MS-DOS **SELECT** or FORMAT commands). See "Preparing the Drive," below, for more information.

Preparing ***the*** *Drive*

Before you can store data on a new hard disk (which has already been physically formatted), you must do the following to prepare it for use:

1. Run the SETUP program to define your hard disk as part of the computer's configuration. (See Chapter 2 for instructions.)

2. Partition and format the drive for your operating system. If you are using MS-DOS, instructions for performing these procedures are provided in your MS-DOS manuals. If you are using another operating system, follow the instructions that came with it.

If you do not prepare the drive correctly, you cannot store data on the disk. For example, if you partition the drive and format it for MS-DOS (or for another operating system) but you do not copy the operating system to the drive, you will not be able to load the operating system from the hard disk.

If you are sure the hard disk was installed properly and you prepared it for use as described above but you cannot access the drive, review the instructions in your operating system manuals. Make sure you performed each step in the installation process correctly for your configuration.

Accessing Data on the Drive

If you have been using your hard disk drive successfully for some time and notice a reduction in performance, the data on the disk may have become fragmented. You may want to back up all your data and then use a disk compaction utility to reorganize the files on your disk. Many general utility programs include a disk compaction utility.

If you still have trouble with your hard disk, you can back up your data and physically reformat the disk. Then you'll need to reinstall the operating system and copy your files back onto the disk. See your operating system manual for instructions.

If you cannot access data on your hard disk or you are receiving read/ write errors, the disk may have a physical problem. Contact your sales representative or the EPSON Connection for assistance.

Software Problems

If you have trouble with an application program, try the following:

1. If the application program does not start, check that you are following the correct procedure for starting the program, and that it is installed correctly. If the program is stored in a directory on your hard disk, make sure you are logged onto or specifying the correct directory. If `you don't have a hard disk, make sure you inserted the correct diskette in drive A.

2. Your computer can run at fast or slow speed. While almost all programs work properly at the faster speed, some must run at the slower speed. Check your software manual to see if this is the case, and change the processor speed if necessary. See "Changing the Processor Speed" in Chapter 3 for more information.

3. If you entered an MS-DOS command that you want to stop, there are special key combinations you can use to cancel the command. These methods may also work in your application programs:

   - ☐ Press **Pause**
   - ☐ Hold down **Ctrl** and press **C**
   - ☐ Hold down **Ctrl** and press **Break**.

4. An application program can occasionally lock the computer, making it unresponsive to keyboard commands. If your computer does not respond when you type on the keyboard, you can reset it. Follow the instructions in Chapter 3.

5. If resetting the computer does not help, remove any diskettes, turn off your system, wait 20 seconds, and turn it back on. Then restart your application program.

If none of these solutions solve your software problem, contact the software manufacturer for technical support.

Printer Problems

Below are some general steps to follow if you have difficulty with your printer. If the problem persists and you need more detailed information, check your printer manual.

If the the problem stems from the port to which your printer is connected, you will see a port error message. See steps 5 and 6, below, for more information about handling port difficulties.

1. If your printer does not work at all, check that the printer has power and is properly connected to the computer. (Also, make sure your printer has paper in it.) See Chapter 1 or your printer manual for instructions.

2. Check the printer manual for the printer's correct DIP switch or control panel settings. These settings help a printer communicate properly with the computer.

3. Many application programs (such as word processors) must be set up properly before they can use a printer. Check your program manual to see what customizing may be required.

4. If you are using an application program that requires a printer driver, make sure the correct driver is installed. See your application program manual for instructions. Also see your printer manual for additional instructions on using your printer with application programs.

5. If your printer is properly set up but is still not functioning, test it from the MS-DOS level. When the screen displays the MS-DOS command prompt (such as `C:\` or `A:\`), hold down Shift and press **PrintScreen.** This should print the contents of the screen on your printer.

   If it does not, you may need to change the internal setting of the computer's parallel port for a parallel printer (or serial port for a serial printer). To do this, use the MS-DOS MODE or SETMODE command. See your printer manual and MS-DOS documentation for more details.

> *Note*
> If you are running Windows, pressing Shift **PrintScreen** copies the screen contents to the clipboard rather than the printer.

6. If you are using more than one serial or parallel port, the computer must know which is primary and which is secondary. See Chapter 2 for instructions on how to set the parallel and serial ports using the **Peripherals setup** option in the SETUP program.

7. If you have an EPSON printer and it is still not working properly, call the EPSON Connection for assistance.

Option Card Problems

If you install an option card and it does not function properly, check the following:

1. Is the option card installed correctly? Make sure it is well-seated in its slot. Check the installation procedure described in Chapter 4 and also see the instructions that came with the card.

2. Did you set the necessary DIP switches or jumpers on the option card? See the card's manual for instructions.

3. Did you set the necessary jumpers on the main system board? See Chapter 4 for more information.

4. Did you run the SETUP program to update your computer's configuration after installing the card? See Chapter 2.

5. If you used the option card to add an external device to your computer, did you use the proper cable to connect the device to the card?

6. Did you perform the correct setup procedures for the software you are using with the option card? See your option card or software manual for instructions.

Mouse Problems

If you have trouble with your mouse or you see an auxiliary device error message, check the following:

1. Make sure the mouse cable is securely connected to the mouse port and not the keyboard port. If you have a serial mouse, make sure it is securely connected to the correct serial port. See Chapter 1 for instructions.

2. Did you install the mouse driver correctly? See your software manual and the documentation that came with your mouse for instructions. (Windows installs a mouse driver automatically.)

3. If you are using a serial mouse, did you disable the built-in mouse port with SETUP and enable the correct serial port? See Chapter 2 for instructions.

Memory Module Problems

If you added extra memory to your system by installing SIMMs and that memory is not operating properly, check the following:

1. If the memory count displayed by the power-on diagnostics program is incorrect, you may not have installed the SIMMs correctly. They may be the wrong type or they may not be inserted all the way.

   See "Memory Modules (SIMMs)" in Chapter 4 and make sure you followed all the instructions.

2. Be sure to run the SETUP program after you install or remove memory modules to automatically update your memory configuration. See Chapter 2 for instructions.

3. If you still have trouble with your SIMMs, write down any error messages that appear and contact your sales representative or the EPSON Connection for assistance.

External Cache Problems

If you added extra cache memory to your system by having cache DIP chips installed, and that memory is not operating properly, check the following:

1. If the cache memory amount displayed by the power-on diagnostics program is incorrect, the cache may have been installed incorrectly by the factory or your Authorized EPSON Servicer. Call your sales representative or servicer to describe the problem.

2. Were jumpers J4 through J7 set to indicate the new amount of cache? Check the jumpers to see if they are set correctly. See "Changing the Jumper and DIP Switch Settings" in Chapter 4 for instructions.

3. If you still have trouble with your external cache, write down any error messages that appear and contact your sales representative or the EPSON Connection for assistance.

Appendix A
Specifications

CPU and Memory

32-bit CPU	Intel® SX, DX, or DX2 processor All systems can be upgraded with a faster microprocessor, including SX2, DX4, and Pentium OverDrive processors, when available
System speed	High and low speeds available; high speed is the speed of the mircroprocessor, low speed is simulated 8 MHz; speed selection through keyboard command or SETUP; 0 wait state memory access at high speed
Memory	4MB RAM standard soldered on the system board; expandable to 40MB (maximum) using 4MB or 16MB SIMMs; SIMMs must be 32- or 36-bit, 72-pin, fast-page mode type with 70ns (or faster) access speed
ROM	128KB system BIOS, video BIOS, and SETUP code located in EPROM on main system board
Shadow RAM	Supports shadowing of system and video BIOS ROM into RAM
Cache	8KB of internal cache (built into the microprocessor); sockets for 64, 128, or 256KB of SRAM external cache (optional)
Math coprocessor	On DX- and Pentium-based processors, math coprocessor built into the microprocessor
Clock/ calendar	Real-time clock, calendar, and CMOS RAM socketed on main system board with built-in battery backup

Controllers

Video	External VL-Bus video card supports high resolution displays (preinstalled on systems sold in the United States); see the video card manual for more information
Diskette	Controller on main system board supports up to two diskette drives or one diskette drive and one tape drive or other storage device
Hard disk	Local bus IDE Interface on main system board supports up to two IDE hard disk drives with built-in controllers

Interfaces

Monitor	VGA interface on external card for analog or multifrequency VGA monitor; 15-pin, D-shell connector
Parallel	One standard 8-bit parallel bi-directional interface built into main system board; I/O address selectable through SETUP; 25-pin, D-shell connector
Serial	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connector
Keyboard	PS/2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector
Mouse	PS/2 compatible mouse interface built into main system board; 6-pin, mini DIN connector
Option slots	Two 16-bit (or 8-bit) I/O expansion slots, ISA compatible, 8 MHz bus speed; two VL-Bus slots, 32 MHz local bus speed; VESA slots can also be used for ISA cards
Speaker	Internal

Mass **Storage**

Diskette drives	Three half-height drives maximum configurable using the following: 5.25-inch, 1.2MB (high-density) capacity 3.5-inch, 1.44MB (high-density) capacity 5.25-inch, 360KB (double-density) capacity 3.5-inch, 720KB (double-density) capacity Dual diskette drive: 3.5, 1.44MB and 5.25-inch, 1.2MB
Hard disk drives	3½-inch form factor hard disk drive(s), up to half-height size; the first mounted vertically, second mounted horizontally
Other devices	Half-height tape drive, CD-ROM, or other storage device; 5¼-inch or 3½-inch with mounting frames

Input *Devices*

Keyboard	Detachable; two-position height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys; NumLock and speed settings adjustable through SETUP

Physical **Characteristics**

Width	14.8 inches (370 mm)
Depth	16.5 inches (412 mm)
Height	4.8 inches (120 mm)
Weight	16.7 lb (7.5 kg), with one diskette drive and one hard disk, but without keyboard

Power Supply

Type	145 Watt, fan-cooled,
Input ranges	90 to 132 and 180 to 264 VAC, switch selectable
Maximum outputs	+5 VDC at 18 Amps, +12 VDC at 4.0 Amps, –5 VDC at 0.3 Amp, –12 VDC at 0.3 Amp
Frequency	47 to 63 Hz

Option slot power limits

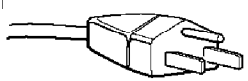
Maximum current	+5 Volts	+12 Volts	–5 Volts and –12 Volts
For each slot	7 Amps	1.5 Amps	0.3 Amp
For all four slots	16 Amps	3 Amps	0.3 Amp

Environmental Requirements

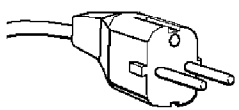
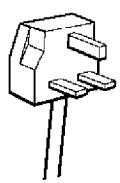
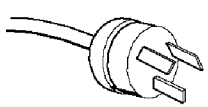
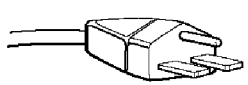
Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 90° F (5° to 32° C)	–4° to 140° F (–20° to 60° C)	–4° to 140° F (–20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	–330 to 9,900 ft (–100 to 3,000 m)	–330 to 39,600 ft (–100 to 12,000 m)	–330 to 39,600 ft (–100 to 12,000 m)
Maximum wet bulb	68° F (20° C)	104° F (40° C)	134° F (57° C)
Acoustical noise	40 dB(A)	N/A	N/A

Power Source **Requirements**

120 Volt power source requirements-

AC plug	Plug type	Reference standards	Power cord
	North America 125V, 10A	ANSI C73.11, NEMA 5-15-P, IEC 83	UL/CSA Listed, Type SJT, no. 18/3AWG, or no. 16/3AWG, or <HAR> 300V, 10A or 13A

240 Volt power source requirements

AC plug	Plug type	Reference standards	Power cord
	Europe 240V, 10A to 16A	CEE 7/7 IEC 83 IEC 127 HD 21	<HAR> 1.00 mm^2 300V, 10A
	UK 240V, 10A	BS 1362 BS 1363A IEC 83 IEC 127 HD 21 EN 60 320-1 ASTA mark	<HAR> 1.00 mm^2 300V, 10A
	Australia 240V, 10A	AS C112 IEC 127 HD 21	<HAR> 1.00 mm^2 300V, 10A
	North America 240V, 15A	ANSI C73.20, NEMA 6-15-P, IEC 83 UL 198.6	UL/CSA Listed Type SJT no. 18/3AWG, 300V, 10A

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system. As new environments become available, these also will be tested.

Microsoft MS-DOS 6.20
Novell® DR DOS® 6.0
Novell NetWare* 2.2,3.12, and 4.01
Novell NetWare Lite 1.1
Novell UnixWare 1.1
IBM® OS/ 2®2.1
SCO® UNIX®release 3.2, version 4.2
SC0 Open Desk top 3.0
Microsoft Windows 3.1
Microsoft Windows for WorkGroups 3.11
Microsoft Windows NT 3.1

* Certified as a workstation and a file server

Your system has also been Novell tested and approved.

Options Available *from EPSON*

Many options for enhancing and supplementing this product are available from EPSON, including the following:

Monitors
Keyboards
Mass storage devices
Memory expansion kits
Processor upgrade kits
Printers
Operating system software

Call your nearest marketing location for more information on specific options.

Serial and Parallel Port Connector *Pin* Assignments

Serial port connector pin assignments

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Signal ground reference	9	Ring indicator
5	Data set ready		

Parallel port connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	Data 8	19	Signal ground
2	Data 0	11	ACK*	20	Signal ground
3	Data 1	12	Busy	21	Signal ground
4	Data 2	13	OUT	22	Signal ground
5	Data 3	14	Select	23	Signal ground
6	Data 4	15	AF	24	Signal ground
7	Data 5	16	Error*	25	Signal ground
8	Data 6	17	Init*		
9	Data 7	18	Selectin*		

*Active low logic

DMA Assignments

DMA assignments

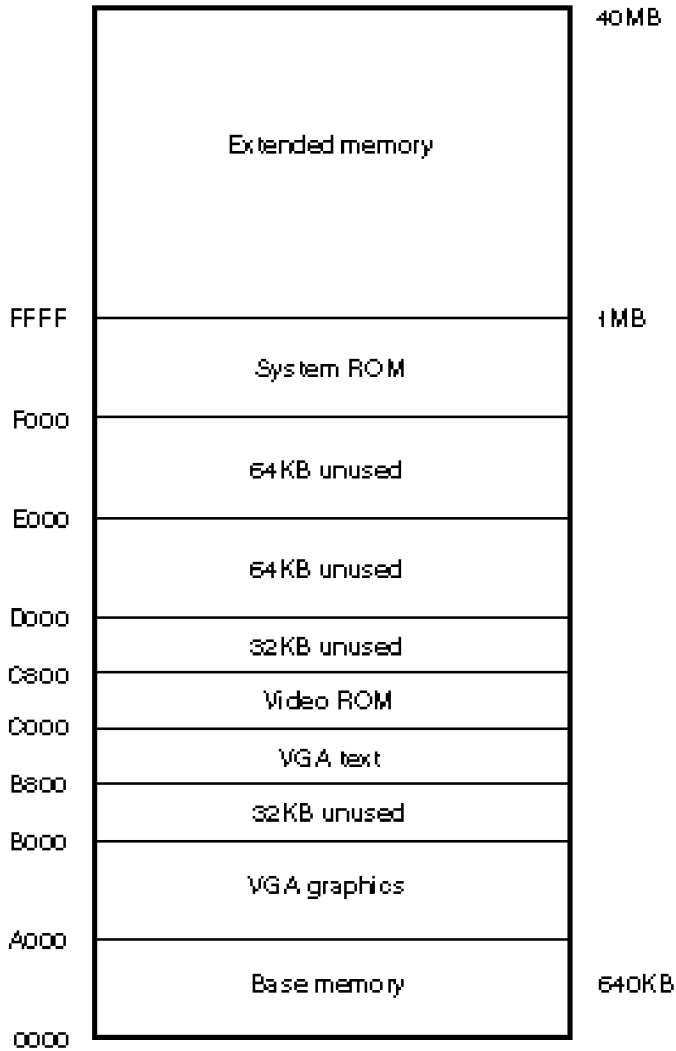
Level	Assigned device
DMA0	Available (8-bit)
DMA1	Reserved (8-bit)
DMA2	FDD controller (8-bit)
DMA3	Available (8-bit)
DMA4	Cascade for DMA controller
DMA5	Available (16-bit)
DMA6	Available (16-bit)
DMA7	Available (16-bit)

Hardware Interrupts

Hardware interrupts

IRQ	Function
IRQ0	Timer output 0 (internally connected)
IRQ1	Keyboard (output buffer full)
IRQ2	Cascade IRQ9
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Parallel port 2
IRQ6	Diskette drive controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Available
IRQ10	Available
IRQ11	Available
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	Hard disk drive controller
IRQ15	Available

System Memory Map



System I/O Address Map

Hex address	Assigned device
000 - 01F	DMA controller 1, 8237A-5
020 - 03F	Interrupt controller 1, 8259A, master
022 - 024	Chip set configuration register
040 - 05F	Timer, 8254-2
060 - 06F	Keyboard controller, 8042
070 - 07F (CMOS)	Real-time clock NMI (non-maskable interrupt) mask
080 - 09F	DMA page register, 74LS612
0A0 - 0BF	Interrupt controller 2, 8259A
0C0 - 0DF	DMA controller 2, 8237A-5
0F0	Clear math coprocessor busy
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk
200 - 207	Game I/O
1ED	CPU speed detection
278 - 27F	Parallel printer port 2
2B0 - 2DF	Alternate enhanced graphics adapter
2E1	GPIB (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31F	Prototype card
360 - 363	PC network (low address)
368 - 36B	PC network (high address)
378 - 37F	Parallel printer port 1

System I/O address map (continued)

Hex address	Assigned device
380 - 38F	SDLC, bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	SDLC, bisynchronous 1
3B0 - 3BF	Monochrome display and printer adapter
3C0 - 3CF	Enhanced graphics adapter
3D0 - 3DF	Color graphics monitor adapter
3F0 - 3F7	FDD controller
3F8 - 3FF	Serial port 1
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter 2)
B90, B93	Cluster (adapter 2)
EE2, EE3	Data acquisition (adapter 3)
1390 - 1393	Cluster (adapter 3)
22E1	GPIB (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GPIB (adapter 2)
62E1	GPIB (adapter 3)
82E1	GPIB (adapter 4)
A2E1	GPIB (adapter 5)
C2E1	GPIB (adapter 6)
E2E1	GPIB (adapter 7)
I/O address (000-0FF) are reserved for the system board	
I/O address (100-3FF) are available on the I/O channel	

Glossary

Access speed

The time it takes for a device, such as memory or a disk drive, to return data. For example, your computer's SIMMs return data requested by the microprocessor at an access speed of 70ns.

Address

The location where information is stored in a computer's memory.

Analog monitor

A monitor that generates or responds to analog data. Analog data is transmitted by varying the voltage levels in a continuous current and can produce an infinite number of colors or gray shades.

Application program

A software program that performs a specific task, such as word processing. Note that an application program is different from an operating system, which controls the computer's hardware and software.

Asynchronous

Data transmission in which one machine sends data to another, one character at a time, at intervals that do not need to be synchronized to a timing device, such as a system clock.

AUTOEXEC. BAT file

The batch file your computer runs automatically whenever you load MS-DOS. It configures the installed system devices and sets various user preferences. See also *Batch file.*

Base memory

See *Conventional memory*

Batch file

A file that executes commands automatically. Batch files are text files with the filename extension .BAT. When you type the filename, the operating system sequentially executes the commands in that file.

BIOS

Basic Input/ Output System. Routines in ROM (Read Only Memory) that handle the transfer of information among various hardware components, and between the hardware and your operating system.

Boot

The process a computer performs to check its components and then load the operating system into memory.

Burst-mode transfer

A transfer of data at every clock cycle of the computer, which almost doubles the normal transfer rate.

Bus

A wire or group of wires that sends information between components in the computer. The speed of a bus increases by the number and width of the channels the bus uses to move data.

Bus ***mastering***

The process of taking over control of the bus. This allows a local bus device to exchange data directly with another local bus device, resulting in a faster transfer of information. See also *Local bus*.

Cache

A high-speed memory buffer that stores frequently used data where your microprocessor can access it faster. Your computer's external cache is expandable to 256KB.

CGA

Color Graphics Adapter. A display adapter card that can generate up to 25 lines of text with 80 characters on each line, two-color graphics at 640 × 200 resolution, or four-color graphics at 320 × 200 resolution.

Chip

A piece of silicon containing miniature transistors and resistors wrapped in insulating material. Chips process electrical signals sent to them and then transmit the processed signals to the computer system. Also called an integrated circuit. See also *CPU*.

CMOS

Complementary Metal-Oxide Semiconductor. A low-power silicon chip used for RAM and switching applications that is backed up by a battery.

Command ***prompt***

The symbol or message that displays on the screen to tell you that the operating system is loaded and ready to receive instructions. The default MS-DOS command prompt displays the current drive and directory. If you are logged onto drive C, the command prompt may look like this: `C:\>`.

Configuration

The setup of your computer's internal and external components. A typical configuration consists of a computer with a certain amount of memory, one diskette drive, and one hard disk drive connected to a monitor, printer, and keyboard.

Conventional memory

The memory in the computer below 1MB that is available to MS-DOS and application programs—usually 640KB. Also called base memory or main memory.

Coprocessor

See *Math coprocessor*.

Copy-protected *program*

A program containing a software "lock" that prevents it from being copied. See also *Key disk*.

CPU

Central Processing Unit. The primary device that interprets instructions, performs tasks, keeps track of stored data, and controls input and output operations. See *also Microprocessor.*

Cursor

The highlighted marker or pointer that shows where keystrokes will appear when typed or where the next mouse command will be executed.

Default

Any value or setting choice that applies when you don't specify an alternative. A default value stays in effect unless you override it temporarily or change the default value itself.

Device

A piece of equipment that is part of a computer system, such as a disk drive, a monitor, or a printer.

Device driver

A file containing instructions that allow your computer to recognize and communicate with a device. The device may be a printer, monitor, or other type of device.

Diagnostics

See *Power-on diagnostics*

DIP ***switch***

Dual In line Package switch. A small rocker- or sliding-type switch that controls a particular function.

Directory

A group of files stored in a particular area on a disk. A directory listing shows the name, location, and size of the files in the directory. A directory can contain both files and subdirectories.

*Display **adapter** card*

A circuit board that can be installed in one of the computer's option slots to control the way a monitor displays text and graphics. Also called video card.

DOS

Disk Operating System. The generic term for the operating system software that controls a computer and directs its input and output functions. See also *MS-DOS* and *Operating system*.

*Double- **density***

A type of diskette format that allows you to store twice as much data as the previously used single-density format. A 3.5-inch, double-density diskette can store 720KB of data. A 5.25-inch, double-density diskette can store 360KB of data.

EGA

Enhanced Graphics Adapter. A display adapter card that allows you to display high-resolution graphics on an EGA monitor. It can display up to 43 lines of text with 80 characters on each line, or it can display monochrome or 16-color graphics at resolutions up to 640 × 350.

***Expanded** memory*

Memory that specially written MS-DOS programs can use when an expanded memory manager program maps that memory into an accessible area. See also *Memory manager*.

***Extended** memory*

Memory above 1MB that is accessed by 386 or 486 microprocessors when they are operating in protected or virtual mode. This memory is available to OS/2 programs, but is available to MS-DOS only if an extended memory manager program is installed. See also *Expanded memory* and OS/2.

Format

To prepare a new disk (or an old one you want to reuse) so that the data you store on it can be used by your operating system. Formatting divides a disk into tracks and sectors and creates addressable locations where your operating system can find the data.

***Heat** sink*

A device used on some microprocessors to absorb and dissipate heat.

High-density

A type of diskette format that allows you to store more data than on single- or double-density diskettes. A 5.25-inch, high-density diskette can store 1.2MB of data. A 3.5-inch, high-density diskette can store 1.44MB of data.

IDE

Integrated Drive Electronics. A type of hard disk drive interface in which the controller is on the drive instead of on a controller card. Your computer includes an interface on the main system board for up to two IDE hard disk drives.

Interface

A physical or software connection used to transmit data between equipment or programs so they can work with each other.

ISA

Industry Standard Architecture. The 8- or 16-bit bus standard developed for IBM compatible computers.

Jumper

A small moveable plug that connects two pins on a device's circuit board. Jumpers alter the operation of a particular function.

Key disk

A diskette containing a copy-protected program that must remain in a diskette drive while you use the program. See also *Copy-protected program*.

Kilobyte (KB)

A unit used to measure storage space in a computer's memory or on a disk. One kilobyte equals 1024 bytes.

LIM EMS 4.0

Version 4.0 of the Lotus®/ Intel/ Microsoft Expanded Memory Specification—your computer's capability to support programs that use expanded memory. See also *Expanded memory*.

Local bus

An internal bus that controls the connections from the microprocessor to the VESA slots and IDE interface on this computer. Local bus provides increased performance and speed. See also *Bus*.

*Main **system** board*

The circuit board inside your computer containing the circuitry and components your computer needs to operate.

***Math** coprocessor*

A device that enables the computer to process mathematical calculations and graphics functions faster by using floating point numbers instead of whole numbers.

Megabyte (MB)

A unit used to measure storage space in a computer's memory or on a disk. One megabyte equals 1024KB (kilobytes).

Megahertz (MHz)

A unit used to measure oscillation frequency, such as that of a computer's internal clock. A megahertz is one million cycles per second.

Memory

The area where your computer stores data. Memory contents are stored permanently (in ROM) or temporarily (in RAM).

Memory manager

A program that controls the memory in your computer so that different applications do not use the same portion of extended memory at the same time.

Memory module

A small circuit board, commonly called a SIMM (single in line memory module), that contains surface-mounted memory chips. You can add memory modules to the main system board to expand your computer's memory.

MGA

Multi-mode Graphics Adapter. A display adapter card that can display monochrome text and color graphics.

Microprocessor

A small CPU on one semiconductor chip. See also *CPU*.

Modem

Modulator/ DEModulator. A device that allows a computer to transfer data to and from another computer by transmitting signals over telephone lines.

Monochrome monitor

A monitor that displays in only one color (such as green, white, or amber).

Mouse

A hand-held pointing device with one or more buttons. Sliding the mouse over a surface moves the cursor in the same direction on the screen. Pressing (or clicking) a mouse button selects the item on the screen at the cursor position.

MS-DOS

Microsoft Disk Operating System. The operating system most commonly used with your computer. See also *DOS*, OS/2, and *Operating system*.

Numeric keypad

The number and cursor control keys grouped together on the right side of the keyboard. The operation of the dual-use keys on the numeric keypad is controlled by the **Num Lock** key.

Operating speed

The speed at which the computer's processor can execute commands, usually expressed in megahertz (MHz). See also *Megahertz*.

Operating ***system***

A collection of programs that manage a computer's operations, such as interpreting input, managing files, and reading and writing data to disk. The operating system (such as MS-DOS, OS/2, or UNIX) provides the foundation for the other programs and controls hardware resources.

Option card

A circuit board you can install inside the computer to provide additional capabilities, such as a modem or an additional I/O port. Option cards plug directly into option slots so you do not have to alter a computer's circuitry to enhance your system.

OS/2

Operating System/2. The operating system developed jointly by Microsoft and IBM that provides protected mode processing and multitasking capabilities. See also *DOS, MS-DOS,* and *Operating system*.

Parallel

An interface that transmits data simultaneously over separate wires in a cable. See also *Interface* and *Serial.*

Pathname

The directory name(s) you specify to locate a file. For example, the pathname for the file SALES, stored in the subdirectory BUSINESS, is \ BUSINESS\ SALES.

Peripheral device

An external device (such as a printer or a modem) connected to a computer that depends on the computer for its operation.

Port

A physical socket on a computer to which you can connect a peripheral device.

Power- on diagnostics

Tests stored in a computer's ROM that the computer runs to check its internal circuitry, peripheral device configuration, and operating status each time you turn it on or reset it.

Processor speed

See *Operating speed.*

Prompt

A message displayed to request information or tell you what action to perform next. See also *Command prompt.*

RAM

Random Access Memory. The area of the computer's memory used to run programs and store data while you work. All data in RAM is erased when you turn off or reset the computer.

Read

To gather data from one source (such as a disk) and transfer it to a device (such as a screen or a printer). For example, when you open a file stored on disk, the computer reads the data from the disk and displays it on the screen. See also *Write*.

Read/write head

The physical device inside a disk or tape drive that reads data from and writes data to the magnetic surface of the disk or tape.

Real- ***time*** *clock*

A clock inside the computer that keeps track of the time and date, even when the computer is turned off, by using power from a backup battery.

Refresh ***rate***

The frequency with which a monitor can redraw a screen image. The faster the refresh rate, the less the screen will flicker.

Reset

To restart a computer without turning it off. You can reset your computer by pressing **Ctrl Alt Delete.** Resetting erases all data stored in RAM and reloads your operating system.

ROM

Read Only Memory. Memory that can only be read and cannot be modified. ROM retains its contents even when you turn off the computer by using power from a backup battery.

Root directory

The main directory in a hierarchical disk directory structure All other directories are subdirectories of the root directory.

RS-232C

A standard type of serial communication. You can connect an RS-232C device to either of the computer's RS-232C serial ports.

Serial

The type of communication that transmits data from a serial interface to a serial device over a single wire. See also *Interface* and *Parallel.*

Shadow RAM

The feature in your computer that copies the contents of the system, video, and external BIOS ROMs into the RAM area of memory to speed up processing.

SIMM

See *Memory module.*

Subdirectory

In a hierarchical disk directory structure, a group of files in a directory within another directory or the root directory.

System diskette

A diskette that contains the operating system and can be used to boot the computer.

Tape drive

The physical device that allows you to insert large-capacity magnetic tape cartridges for compact data storage and backup.

UNIX

An operating system that supports multitasking and is especially suited to multi-user environments. UNIX is compatible with a range of computers, from personal computers to mainframes. See also *Operating system*.

VESA

Video Electronics Standards Association. The standards set for a common hardware and software interface to super VGA video adapters and other high-performance local bus devices. VESA (or VL-Bus) interfaces support 32-bit data transfer at speeds of up to 33 MHz, allowing your computer to process 20 times more data per second than an ISA bus.

VGA

Video Graphics Array. A high-resolution display adapter that provides a variety of video modes.

Video card

See *Display adapter card.*

VL-Bus

Abbreviation for VESA local bus. See also *VESA*

Write

To transfer data to a storage device (such as a disk) or an output device (such as a monitor or printer). See also *Read.*

Write-protect

To protect the data on a diskette from being changed by setting the write-protect switch on a 3.5-inch diskette or by placing a write-protect tab over the notch on a 5.25-inch diskette. You cannot change data on a write-protected diskette.

ZIF socket

Zero Insertion Force socket. The type of socket on your system board that holds the microprocessor. With this type of socket, it is easy to remove and install processor chips.

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